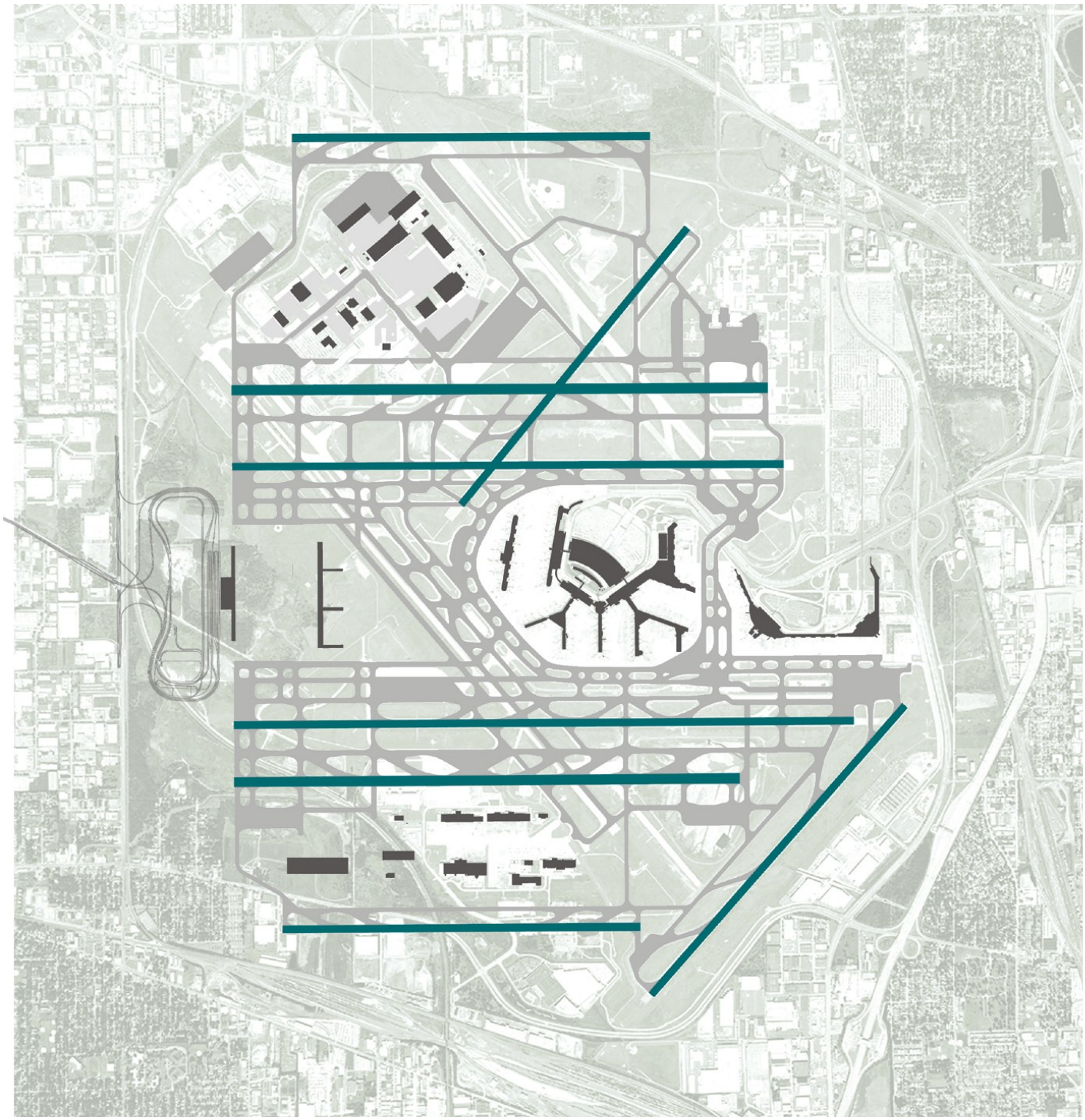
O'Hare Modernization Program
October 2003

Response to ALP Comments



Introduction

In December 2002, the City of Chicago Department of Aviation submitted a draft Airport Layout Plans Package depicting the proposed development under the O'Hare Modernization Program to the Federal Aviation Administration (FAA) for review and comment. Documentation supporting the ALP development was subsequent delivered to FAA in February and March, 2003.

In May 2003, FAA provided technical comments on the draft Airport Layout Plans Package, compiled from all FAA and TSA offices with the exception of the FAA's Great Lakes Region Air Traffic Division. Subsequently, FAA provided supplemental comments on the utilization of the airfield and surrounding airspace from an operational perspective in August 2003.

This document presents responses to the individual comments received from the FAA on the draft Airport Layout Plans Package. The comment matrix presented in the following sections details the specific comments received from the FAA on the Draft Airport Layout Plan dated December 2002. For each comment received that pertained to the drawing set, a response has been included describing the action that was taken, if any, to modify the ALP Set. This document does not detail any comments, or subsequent actions, that pertain to the draft reports that were submitted in early 2003. Comments specific to these reports will be addressed in the future in a separate effort.

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A-GENERAL SAFETY AND SECURITY COMMENTS

TECHNICAL COMMENTS

Ref. No.	Comment	Response
A-1)	NAVAID critical areas should appear on the existing and future Airport Layout Plan (ALP) unless otherwise noted. This request is in accordance with AC 150/5300-13, Airport Design, Appendix 7, Paragraph 7. C. (6) which states, Drawing Detail- normally limited to existing and future airport features which would indicate aeronautical need for airport property. The missing NAVAIDs on the Existing and/or Future ALP, which will require aeronautical review (Sheet #1 &2) are:	NAVAID critical areas have been added to existing and future airport layout plans
a.	VHF Omnidirectional Range (VOR) critical area of 1000'.	VOR critical area has been added
b.	Airport Surveillance Radar (ASR) Critical Area of 1500'.	ASR critical area has been added
c.	Low-Level Wind Shear Alert System (LLWAS). Coordinates for the LLWAS are included as Appendix C.	Existing and future LLWAS stations have been added to existing and future airport layout plans
d.	The National Weather Service owned Automated Surface Observing System (ASOS) and its 500' critical area.	The NWS ASOS has been added to existing and future airport layout plans
e.	Distance Measuring Equipment (DME) facilities, which are co-located with Localizer facilities.	DME antennas added to LOC/ALSF-2 buildings on future airport layout plan
f.	Inner Markers (IM)s.	Inner markers have been added to future airport layout plan
g.	VOR Test Facility (VOT), which is co-located with RTR-A.	VOR test facility has been added
h.	Remote Transmitter/Receiver (RTR)- U, West Terminal Area.	Relocated RTR-ORD is shown on the west satellite concourse on the future airport layout plan
i.	Precision Approach Path Indicators (PAPI)s.	Existing PAPIs are shown on the existing airport layout plan and future PAPIs added to the future airport layout plan
j.	RTR-D.	Relocated RTR facilities are shown on the

Ref. No.	Comment	Response
		future airport layout plan
k.	Localizer Far Field Monitors (FFM)s, two of which are normally located on runway extended centerline at least 50 feet apart, just outside the RSA.	Localizer FFMs have been added to the future airport layout plan
A-2)	The future ALP does not clearly identify the impact of the railroad realignment on the new Approach Lighting System (ALS) for runways 10C, 10L, 10R 9R, and 9C.	ALSF-2 light-bar stationing on the future airport layout plan has been adjusted to clear the railway where necessary and approach light plane profiles alternatives have been examined to ensure that rail traffic will not cause any obstruction
A-3)	Construction of the north runway will impact on 32R Localizer (LOC). The future ALP does not clearly identify a plan for minimizing this impact.	The City of Chicago's O'Hare Modernization Program Office is examining all construction phasing issues in detail. This group will develop plans to minimize impacts to the 32R localizer
A-4)	Although the future ALP documentation mentions that the infrastructure (i.e. FAA power cables, fiber optics, et.) will be improved, the future ALP documentation does not clearly state how the improvements will be tied into the planned phases.	Phasing of power and communications infrastructure improvements will be addressed in detail during engineering design
A-5)	The future ALP and associated documentation do not clearly identify a schedule that will determine how runway construction and facility installation/relocation is conducted to minimize impact.	The City of Chicago's O'Hare Modernization Program Office is examining all construction phasing issues in detail. Plans are being developed to minimize impacts to all facilities during implementation
A-6)	All FAA National Airspace System facilities will require extensive siting evaluation to determine the optimal location, in accordance with applicable FAA Orders, Advisory Circulars and Siting Criteria. Specifically, the placement of the VOR, ASR, Air Traffic Control Tower (ATCT), LOC, Glide Slope (GS), Inner Marker (IM), DME, communication and weather system facilities, Etc. will require additional engineering to determine proper placement.	Detailed engineering evaluations to determine correct NAS facility placement will be conducted during engineering design

Ref. No.	Comment	Response
A-7)	Extensive ductwork and fiber modifications will be needed. A number of facilities will be required (ASR, Communication, ILS, ect.) to support the future O'Hare Modernization Program (OMP). Proactive, aggressive planning will be necessary to support the infrastructure requirements within the time periods identified.	Detailed ductwork and fiber optic cable routing plans will be developed during engineering design. The City of Chicago's O'Hare Modernization Program Office will coordinate with FAA through all phases of development to ensure that the various required NAVAID and communications facilities are in place as needed.
A-8)	All facility and/or infrastructure additions, modifications, relocations and/or removals required to implement the future ALP will require a reimbursable or similar type agreement.	The City of Chicago's O'Hare Modernization Program Office will coordinate with the FAA on all agreements necessary to develop required infrastructure and facilities
A-9)	FAA acceptance of any future ALP does not authorize any construction. The review and comments associated with Case number 2002-AGL-0848-NRA, O'Hare International Airport Draft Plan, is for planning purposes only. Construction will not be permitted until the FAA issues a final Environmental Impact Statement and a Record of Decision. In addition, planned construction shall be reviewed in depth and open to a full airspace evaluation.	The City of Chicago's O'Hare Modernization Program Office understands that the review and comments associated with airspace number 2002-AGL-0848-NRA are for planning purposes only, and that other regulatory processes may apply to the implementation of this program.
A-10)	The FAA, Airway Facilities (AF), System management Office (SMO) is responsible for all existing FAA facilities. Work impacting FAA equipment as a result of the project will require the sponsor/contractor to notify the FAA AF, SMO of the project pre-construction meeting. Sponsor is responsible for establishing a reimbursable agreement to provide projects to protect, relocate, or re-establish FAA equipment that will be disturbed during sponsor's project. Before each construction activity begins, FAA AF, SMO shall be contacted to provide exact locations of existing facility cables.	The City of Chicago's O'Hare Modernization Program Office will coordinate with the Systems Management Office through all phases of development
A-11)	Lighted navigational aids that may be impacted and will require additional information or phasing plan for reconfiguration are:	The City of Chicago's O'Hare Modernization Program Office is examining construction phasing issues in detail and will coordinate with the FAA on any required

Ref. No.	Comment	Response
		reconfiguration of existing lighted navigational aids
a.	Phase 1A: 14L Approach Lighting System with Sequenced Flasher, Category 2 (ALSF-2) & PAPI;	
b.	Phase 1B: 27L Medium-Intensity Approach Lighting System With Runway Alignment Indicator Lights (MALSR) & PAPI, 9R MALSR & PAPI;	
c.	Phase 1C: 32L MALSR & PAPI;	
d.	Phase 2A: 9L & 27R MALSRs & PAPIs;	
e.	Phase 2B: 32R PAPI & 14L ALSF-2; and	
f.	Phase 2C: 14R ALSF-2 & PAPI.	
A-12)	The localizer/ALSF-2 building can be sited as a localizer building, up to but not closer than 250 feet from runway extended centerline and clear of the Obstacle Free Area. They must also be accurately sized. We anticipate that these buildings will be 24' x 68' in size.	Localizer/ALSF-2 buildings have been correctly sized and located per comment
A-13)	Localizer antenna array placements require correction. Where the localizer antenna arrays are shown centered 1,000 feet out from the end of a runway, the future ALP must be changed to show them centered at least 1,010 feet out. This ensures that no part of the array is inside the runway safety area (RSA). The localizer critical area must be adjusted accordingly.	Localizer sitings have been changed per comment and discussions during FAA working sessions
A-14)	Glide Slope facility composition requires correction. A Glide Slope facility consists of an antenna mast with a building immediately behind the mast (within 10 feet), not remote from the mast. The locations and sizes of the Glide Slope buildings {labeled Glide Slope/Runway Visual Range (RVR) buildings} are not accurately shown on the future ALP. Glide Slope buildings are approximately 10' x 12' in size.	Glideslope facilities have been correctly sized per comment
A-15)	Glide Slope distance from runway centerline requires correction. The future ALP incorrectly depicts the location for the glide slope Facility in relation to the runway centerline. FAA Order 6750.16C, *Siting Criteria for Instrument Landing Systems*, Paragraph 27.c. Category II and III Glides Slopes should be located at a minimum distance of 400 feet from the runway centerline. It has been observed that to make all elements of the glide slope facility (antenna mast and building) clear the runway Object Free Area (OFA) the facility would have to be centered 407 feet off runway centerline. This siting would make the facility encroach upon the taxiway OFA of an Airplane Design Group VI taxiway whose centerline is 600 feet from runway centerline. This conflict must be resolved. The Runway 10R glide slope, shown 325 feet off runway centerline, must be sited not less than 400 feet off centerline. The height of	Glideslope lateral siting changed to 407' from runway centerline for all runways. Taxiway configurations for 9C-27C, 10L-28R & 10C-28C result in taxiway object free area penetrations by glideslope facilities at this spacing. Per FAA this is acceptable for required navigational aids with siting fixed by function.

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	the glide slope antenna mast is limited by the height-limiting formula in FAA Advisory Circular 150/5300-13, Airport Design, Paragraph 306c(2)(b). By this formula, the maximum height of an antenna 400 feet from runway centerline is x feet above the elevation of the crown of the runway abeam the glide slope antenna mast. If the finished grade elevation at the glide slope antenna mast is 4.0 feet below the runway crown elevation abeam the mast, then the maximum allowable antenna mast height is x' + 4.0' above finished grade. Moving the Runway 10R glide slope out to 400 feet might require moving the fence and the ditch respectively. In addition, the traffic on Irving Park Road and the fence are of concern at the point where they curve in a northerly direction. (See Comment #90 in "Phase 2C – Runway 10R/28L")	
A-16)	Glide Slope distance from runway threshold requires correction. Where the runway is perfectly horizontal, a glide slope sited 1,050 feet from the threshold would produce a 55-foot Threshold Crossing Height (TCH). Per FAA Order 8260.3B, the standard optimum TCH for Category (CAT) -II and Cat-III approaches for the height group 4 airplane (TERPS) is 55 feet. It is important to site the glide slopes to achieve 55' TCHs, to ensure that the flight-checked actual TCHs are between 50 feet and 60 feet. For a Cat-II or Cat-III approach, the TCH is required to be between 50 feet and 60 feet. On the future ALP, many of the glide slopes for the new runways are sited other than 1,050 feet from threshold.	Glideslope longitudinal distance from runway threshold has been adjusted per comment and discussion during NAVAID working sessions. Preliminary runway centerline profiles were used to calculate the longitudinal siting that would provide a 55' TCH. Runways 9C, 9R, 10L & 10C were subject to siting constraints due to required connecting taxiways. Glideslopes were sited to provide required clearance to shelters and PAPIs on either side of connecting taxiways, per discussion at NAVAID working sessions, and the resultant threshold clearing height (TCH) calculated. Preliminary glideslope TCHs for each runway are as follows: 9L = 55.0'; 9C = 58.3'; 9R = 57.3'; 10L = 57.0'; 10C =54.3'; 10R = 55.0'; 27R = 55.0'; 27C = 55.0'; 27L = 57.1'; 28R = 55.0'; 28C = 55.0'; 28L = 55.0'.
A-17)	Glide Slope snow removal areas should be modified to meet standard. The glide slope snow removal pads are sized incorrectly on the future ALP. FAA Order 6750.49A, Maintenance of Instrument Landing System (ILS) Facilities requires that snow deeper than 18 inches be removed in front of a glide slope, to prevent signal distortion, or, if the snow is not removed the approach minima will be raised to localizer-only minima for category "D" aircraft and Category (CAT) II/III service will be unavailable. To facilitate snow removal, the FAA maintenance organization insists that the hard-surfaced snow removal areas be constructed in	Glideslope snow clearance areas have been resized per comment

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	front of each glide slope facility. See appendix B.	
A-18)	PAPI placement requires correction. Eight PAPIs are paired with eight glide slopes on the new runways. In accordance with FAA Order 6850.2A, Visual Guidance Lighting Systems, in order to accommodate height group 4 airplanes (TERPS), the PAPI must stand 300', +50', -0' behind the glide slope source (antenna mast). In addition, PAPI lamp housings are not permitted to be closer than 50 feet to the edge of a runway or taxiway. The distance criteria produces glide slope/PAPI problems with intervening connector taxiways. See the PAPI discussions in the "Phasing Comments" section under individual runway instrumentation in this document.	PAPIs have been sited per comment
A-19)	Inner Markers are missing from the future ALP. Inner Markers (IM) must be shown on the future ALP. IMs would be sited at 860 feet from threshold. This assumes that the TCH will be 55 feet, and that the runway threshold is the highest point in the touchdown zone. In all cases, the west ends of the new runways are substantially higher than the east ends, and the west ends are probably the highest points in the touchdown zones. Therefore, the 860-foot siting for the IM's on the Runways 9's and 10's is probably valid. On the Runways 27's and 28's, the touchdown zone elevations can be expected to be up to 5 feet higher than the runway threshold elevations. Therefore, the actual IMs will probably have to be sited up to 95 feet farther out than 860 feet. The IM siting problems on the Runways 28L, 28C and 28R approaches result from runway and taxiway conflicts.	Inner markers have been added to future ALP per comment. Where possible, inner markers have been sited on the runway extended centerline directly below the 100' decision height. The exceptions to this are runways 28R, 28C & 28L where runway 4R-22L and associated taxiways interfere with siting. These inner markers may require a NCP waiver to allow either offset siting or approach light plane penetration.
A-20)	The Mid-Field RVRs are shown nominally, but the exact locations will be determined upon facility design. The Runway 10R/28L Mid-Field RVR will probably stand 3,000 feet west of the Runway 28L end, and 270 feet south of runway centerline. This siting is to maximize the distance from the ditch and pond to the south, and to minimize the access road route to Taft Road to the south.	Provisional mid-field RVR sites shown. Detailed siting evaluation will take place during engineering design.
A-21)	Localizer Far Field Monitor (FFM) antennas are not shown on the future ALP. The approaches on which their siting is a problem are the Runway 9L, Runway 28C, and Runway 27R approaches.	Localizer far field monitors have been added to the future ALP per comment and discussions at NAVAID working sessions
A-22)	Underground diesel fuel storage tanks are required at some locations. It is assumed that each of the LOC/ALSF-2 buildings will contain a diesel engine generator. Each engine generator requires a minimum of a 1,000-gallon diesel fuel tank. The localizer buildings must be well within the Runway Protected Zone (RPZ), therefore, so must the tanks. Therefore, the tanks must be underground rather than aboveground. The underground tanks must meet all the applicable environmental requirements.	Comment noted. Localizer and ALSF-2 buildings and associated equipment will be designed to meet applicable requirements.

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A-23)	Runway 28L, 28C and 28R ALSF-2's will cross Runway 4R-22L. Runway 28R (existing 27L) already has light bases embedded in the blast pad and Runway 4R-22L. For the Runway 28C and 28R ALSF-2's, the light bases for the ALSF-2 semi-flush steady-burning and flashing lights must be embedded in Runway 4R-22L and the taxiways that the ALSF-2s cross. The light bases must continuously drain by gravity. The semi-flush lights of these ALSF-2s will be subjected to snowplowing and some will be subject to airplane wheel loads. Numerous frangible mounted lights and flasher ICCs near taxiways and Runway 4L-22R will be subject to blown snow and ice. For these reasons, substantial damage and the need for replacement is anticipated. Expect the Runway 28L, 28C, and 28R ALSF-2s to require more maintenance than the other nine ALSF-2s. Maintenance access to these ALSF-2s will also be more difficult than for the other nine ALSF-2s. Almost the entire Runway 28L and 28C ALSF-2s will lie within runway and taxiway safety areas. The DOA will have to make allowances for maintenance down time for ALSF-2 maintenance in RSAs.	Comment noted. The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA on facility maintenance and operations.
A-24)	Runways 4R-22L and 4L-22R localizer antenna arrays are inside RSA. These four antenna arrays are less than 1,000 feet from the stop end of the runway they serve, and are therefore in RSAs. Corrective action is required to meet the FAA RSA area of 1000' and the standard localizer siting of 1010 feet from end of runway.	Runway Safety Area penetrations for the existing runways will be the subject of further separate analysis conducted by The City's Department of Aviation in conjunction with the FAA. Alternatives will be evaluated to improve those existing runways that are not proposed to be modified, and implemented improvements where practical.
A-25)	ILS holding position markings (hold line) at glide slope critical area. It is sometimes necessary to prevent airplanes from entering a glide slope critical area as they taxi on a parallel taxiway that runs past the glide slope facility. To define the point at which the airplanes must hold short of the edge of the glide slope critical area, an ILS hold line is painted across the parallel taxiway. The point at which the ILS hold line is painted across the parallel taxiway is the intersection of the edge of the critical area with the inner edge of the taxiway. The inner edge of the taxiway is the edge closest to the runway that the glide slope serves. If the new glide slopes are all 1,050 feet from runway threshold, the ILS holds lines will be between 820' and 850' from threshold. Present guidance on use of the ILS hold lines is as follows:	ILS holdline markings added per comment
a.	If weather conditions are less/worse than 800-2, airplanes must hold behind the ILS hold line.	
b.	If weather conditions are 800-2 or better, airplanes may taxi past the ILS hold line.	
A-26)	The ALSF-2s of future Runways 9L, 9C, 9R, 10L, 10C, 10R, 27L, 27C, 27R, and 28R, are all	Off-airport access to ALSF-2 installations

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	shown crossing public roadways.	will be provided. Access details will be determined during engineering design. Note 9 added to future ALP to reflect this intent.
a.	Permits for these crossings will be required from the government bodies administering these roadways.	
b.	To facilitate the issuance of permits for construction within the rights of way of these roadways, it is essential that the DOA begin planning with the responsible entities now, if that planning is not already in progress.	
A-27)	The ALSF-2s of future Runways 9L, 9C, 9R, 10L, 10C, and 10R are all shown crossing railroad tracks. Permits for these crossings will be required from the railroad. To facilitate the issuance of permits for construction within the railroad right of way, it is essential that the DOA begin planning with the railroad now, if that planning is not already in progress.	The City of Chicago's O'Hare Modernization Program Office is coordinating with the railroad owners on an ongoing basis regarding impacts to the railroad associated with airport development
A-28)	Elements of the ALSF-2s of future Runways 9C, 9R, 10L, and 10C are shown west of York Road on land that is shown off airport property. It is the DOA's responsibility to furnish all the interests in real estate required for the establishment of navigational aids. For ALSF-2, the interests include land on which to install light bar structures, cable ducts and cables, access roads and walkways, personnel ingress and egress, security, appurtenances, and avigation easements to protect the approach light planes from penetration. These avigation easements will be for airspace below the 14 Code of Federal Regulation (CFR) part 77, 50:1 approach light plane. For the Runways 9C and 10L ALSF-2s, facility elements will have to be constructed on existing buildings off airport property. If these buildings are to remain, then the DOA must obtain special real estate interests that will be mutually acceptable to the owner of the ALSF-2 and of the buildings, which are to be depicted on the Future On-Airport Land Use Plan.	Off-airport access to ALSF-2 installations will be provided. Access details will be determined during engineering design. Note 9 added to future ALP to reflect this intent.
A-29)	Provide DME service (tuned to ILS frequency) on all ILS systems at O'Hare. If this is not feasible, as a minimum, all category II/III ILS systems should have co-located DMEs.	DME antennas shown on LOC/ALSF-2 buildings
A-30)	The Low Level Wind Shear Alert System (LLWAS) sites shall be shown on the existing and future ALP. Please see Appendix C, LLWAS Station Locations. The O'Hare Modernization Program will seriously affect the twenty (20) LLWAS poles. A number of the remote pole sensing stations will need to be relocated due to their proximity to future construction. The LLWAS system will require a new meteorological study to determine the number of poles to be re-located and any additional LLWAS poles needed for proper wind shear detection of the future runway alignments.	Existing and future LLWAS stations added to existing and future ALPs.

Ref. No.	Comment	Response
A-31)	The construction of buildings "R11" and "R10" may obscure the line of site from the current ATCT to areas of Taxiway Y between Taxiway T and the United Hangar and may require mitigation. There is an existing impact to this area that may be reduced by the removal of various hangars to accommodate the construction of Runway 9C.	North ATCT will have clear sight lines to Taxiway Y
A-32)	All aircraft holding pads must be evaluated with respect to the type(s) of aircraft that can hold inside the pads while providing the required wingtip clearance for aircraft passing by or through the hold pads.	See Appendix D for hold pad details
A-33)	Recommend a maintenance equipment facility on the north airfield to support required airport operations such as snow removal, airfield maintenance, etc. The FAA is concerned with the distance to the north side of the airfield from the current AMC Building.	The City of Chicago's O'Hare Modernization Program Office is considering maintenance equipment facility requirements on future airport. A potential north airfield site for maintenance development has been identified on the Future ALP.
A-34)	With the significant increase in pavement, the City of Chicago will need to evaluate the additional snow removal equipment that will be necessary to maintain an effective operation. In addition, the City must continue to meet FAR Part 139 clearance times for snow removal as outlined in AC 150/5200-30A Airport Winter Safety and Operations.	The City of Chicago's O'Hare Modernization Program Office will evaluate equipment requirements on an ongoing basis, and will continue to ensure that Part 139 snow clearance times are met.
A-35)	Existing Taxiway A & B restrictions should be reviewed based on additional aircraft with wingspan greater than the B-747. It must be clearly addressed what aircraft can utilize each respective taxiway. Any new operational restriction should be based on wingspan versus aircraft type.	It is not practicable to provide taxiway A to B separation standards for ADG-V aircraft. The use of Taxiway A by ADG-V aircraft is accomplished through an existing Grant of Exception with certain restrictions. Taxiways A & B will be restricted from use for aircraft with wingspans of 214 feet or greater.
A-36)	List all existing and future operational and physical restrictions, including but not limited to those on taxiways, runways, aprons and gate areas.	Operational restrictions have been listed and are provided in Appendix A.
A-37)	Open RSAT action Item ORD-02-007 should be addressed during development (to be completed by December 31, 2005). ORD 02-007 requests installation of the taxiway centerline lights at turn radius from Taxiway B to Taxiway P; the turn radius from Taxiway A to Taxiway P; the turn radius from Taxiway P (northbound) to Taxiway H (westbound); the	The RSAT Team should work with the City of Chicago's O'Hare Modernization Program Office to assess the implementation phasing of RSAT Item ORD-02-007.

Ref. No.	Comment	Response
	turn radius from Taxiway H (westbound) to Taxiway B (southeast bound).	
A-38)	Will the existing pavements used by ADG VI be structurally upgraded or do they currently have adequate strength for NLA operations? The Concept Development/Refinement Report states that NLA will be restricted to airport pavements built to ADG VI standards. One standard mentioned is new pavement with adequate strength for NLA (i.e., A380) operations. PDR Exhibit 9 indicates the designated NLA taxi routes. These designated NLA taxiways include many existing pavements, which according to the ALP have existing pavement strength limitations.	Existing pavement intended for use by ADG VI aircraft has been identified. Pavement strength will be evaluated to determine acceptability for ADG VI operations and appropriate upgrades will be provided if necessary.
A-39)	Future Runway Safety Area (RSA) Analysis: Section 11 of the Project Definition Report states that, "There are several instances where the existing airfield deviates from standards in accordance with historical FAA waivers. For all new and relocated runways, and all runways that are extended, all Runway Safety Areas and Object Free Areas are proposed to meet standards, even where they might not have previously. Table 8 presents the disposition of the existing deviations" (p. 82, *Project Definition Report*). The objective of the FAA's Runway Safety Area Program is that all RSAs at federally obligated airports and all RSAs at airports certificated under 14 Code of Federal Regulations (CFR) part 139 shall conform to the standards contained in AC 150/5300-13 Airport Design, to the extent practicable. Based on the large scope of the O'Hare Modernization Program and long term planning horizon, all safety areas on the airfield should be brought up to standards as soon as possible within the planning period. The table in Section 11 and the additional text in the Project Definition Report does not indicate full RSAs are not practicable for Runway 4L/22R and 4R/22L. Therefore, full standards should be depicted, described and included in plans for implementation. The use of declared distances to achieve a full RSA is not acceptable (see comment #41 of this section). In addition there are items noted in this attachment under each phase that describe items on the Future ALP (Sheet #3) that need to be verified and correlated with the text in Section 11 of the Project Definition Report.	Runway Safety Area penetrations will be the subject of further separate analysis conducted by The City's Department of Aviation in conjunction with the FAA.
A-40)	Future Object Free Area (OFA) Analysis: AC 150/5300-13, defines the OFA as "an area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes." Items noted in this attachment under each phase describe items on the Future ALP (Sheet #3) that must be verified and removed.	See comments on object free areas
A-41)	Future Runway Protection Zone (RPZ) analysis: AC 150/5300-13, defines RPZ as "an area off the runway end to enhance the protection of people and property on the ground." Items noted in this attachment under each phase describe items on the Future ALP (Sheet #3) that.	Future avigational easements have been added to the future airport layout plan where RPZs extend beyond airport property in

Ref. No.	Comment	Response
	must be verified and removed. Fee simple land acquisition is the preferred method for protecting the RPZ, especially for new runway facilities, especially to this scale. There are no navigational easements or acquisition depicted on the Future ALP where the RPZ extends beyond the future airport property (Runway 10C, 10L, 9R, 9C, 9L, 27R, and 28R). Zoning restrictions are not considered adequate for protecting the RPZ. If the City uses navigational easements to protect the RPZ, the agreements must have standards to protect against non-compatible uses, obstructions and navigational interference	accordance with AC 150/5300-13. Control of the RPZ's will be pursued wherever practical.
A-42)	Declared Distance Analysis: In accordance with AC 150/5300-13 the use of declared distances for airport design shall be limited to cases of existing constrained airports where it is impracticable to provide the RSA, OFA, or RPZ in accordance with design standards. If an airport operator wishes to implement declared distances, all relevant information and the appropriate justification must be provided, which would include operational constraints and any numbers, percent, and condition imposed by meeting standards. In addition to adequate justification for declared distances, the following information on the future ALP Drawing set and information in the Project Definition Report must be verified and updated.	Runway 10C-28C TORA/TODA of 10,800-feet is provided to maximum gross take-off runway distance for the A380 New Large Aircraft (NLA). Runway 10C-28C will be the only runway designed for ADG-VI aircraft during Phase 1 of the OMP Project. Declared landing distance available (LDA) of 10,540 feet will be required for arrivals on Future Runway 10C to protect for unrestricted simultaneous taxi operations on Taxiway 'S' for aircraft with wingspans up to but not including 262 feet (ADG-VI). The required Runway 10C LDA is 10,540'. Runway 10L-28R TORA/TODA of 13,000 feet is provided to maximize gross-takeoff runway distance for "long-haul" international departures. Runway 10L-28R will be the longest runway and equivalent in departure length to Runway 14R-32L (to be decommissioned). Declared landing distance available (LDA) of 12,246 feet will be required on Future Runway 10L to protect for unrestricted taxi operations on Taxiway 'Q' for aircraft with wingspans up to but not including 214 feet (ADG-V). The required LDA is 12,246'.

Ref. No.	Comment	Response
a.	A Declared Distance drawing used to clearly depict declared distance criteria applied on the future ALP.	Declared distances drawing has been added to the ALP set (see sheet 13 of the ALP set)
b.	Declared distance information should be provided on Sheet #4 for Runways 10L/28R and 10C/28C. Currently, only LDA data for 10L and 10C is presented in the Airport Data Sheet.	All declared distances have been added to the airport data sheet for 10L-28R and 10C-28C
c.	Runway 10C/28C declared distance issues/questions:	
i)	Only 10C LDA is presented in the notes (10,543'). LDA, ASDA, TORA, and TODA must also be presented if declared distances are planned. Also, declared distance data for the Runway 28C end should be provided as well. This information should be depicted on the Airport Data Sheet and a separate Declared Distance drawing.	Full declared distances information presented on the declared distances drawing and the airport data sheet
ii)	In the Project Definition Report, the narrative states that "a declared distance LDA of 12,543' (report text should be corrected to read 10,543') has been applied to Runway 10C to provide at least 1,000' of safety area beyond the LDA, specifically to preclude the wings of aircraft on Taxiway "S" from penetrating the safety area" (Page 8). Thus, the Runway 10C LDA is sited approximately 57 feet to the west of the Runway 28C displaced threshold. However, the RSA for Runway 28C is depicted as extending to the edge of Taxiway "S", not the ADG VI taxiway safety area/wingtip clearance (approximately 131' either side of taxiway centerline for the A380). Clarify operational status of Taxiway S. "S" during west flow configuration. The taxiway S and Runway 28C safety area must not overlap.	An LDA of 10,540' has been provided to allow aircraft with wingspans up to but not including 262 feet (ADG VI) to taxi on 'S' during east-flow arrival operations on 10C. In a west flow configuration during 28C departures, simultaneous taxi operations would be permitted on Taxiway S. In a west flow configuration during arrival operations on Runway 28C, aircraft would be restricted from the movement areas within the Runway 28C RPZ (i.e. Taxiway S).
iii)	No approach or departure RPZ's are depicted. The departure RPZ should be depicted on the Declared Distance drawing.	Departure RPZs are depicted on the future declared distances drawing
d.	Runway 10L/28R declared distance issues:	
i)	Only 10L LDA is presented in the notes (12,249'). LDA, ASDA, TORA, and TODA must also be presented if declared distances are planned. Also, declared distance data for the Runway 28R end should be provided as well. This could be accomplished on the Airport Data Sheet or a separate Declared Distance drawing.	10L-28R declared distances are detailed in the airport data sheet and future declared distances drawing.
ii)	No approach or departure RPZ's are depicted. The departure RPZ should be depicted on the Declared Distance drawing	Departure RPZs are depicted on the future declared distances drawing
A-43)	Elevation and end coordinate analysis:	
a.	An update in airport and NAVAID magnetic variation is recommended. Currently the airport	Magnetic variation shown on ALP has been

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	is using the 1980 magnetic variation of 0 degrees, the ORD VOR/DME is using the 1965 magnetic variation of –2 degrees, the current and 2005 value is also –2 degrees. There will be no change in runway numbering as a result of this update. The current magnetic variation must be shown.	updated and is current as of September 23, 2003
b.	New runway end coordinates, runway end elevations, runway touchdown zone elevation and all facility data must be in accordance with FAA 405 Specifications. If the airport elevation changes by 1.0 foot all Standard Instrument Approach Procedures (SIAPS) will have to be revised. Also construction of a runway and establishment of localizer and DME equipment will require development of new and revisions of existing SIAPS, at the airport. (To meet publication cutoff dates a minimum of 12 months or up to 1 1/2 years, based on complexity and current workload, may be required, to revise existing and develop new SIAPS. Any new runway pavement will have to be flight checked for day/night operations: Reference United States Standard Flight Inspection Manual OAP 8200.1, Chapt.100, Sect.104, types and priorities of flight inspections.)	Runway elevations provided to the nearest one-tenth of a foot, per NAS 405 specifications
c.	Verification of coordinates using GEO83 program resulted in the following runway length and azimuth discrepancies (see table below). In addition there seems to be a discrepancy in the Runway length depicted for Runway 10C/28C. The length of 10,600 feet on the future ALP is from the 10C threshold to the Runway 28C displaced threshold. The full runway length as depicted would be 10,800' if there were a 200 feet displacement at the east end of the runway. The threshold is shown as displaced on the future ALP and in the Project Definition Report but no threshold displacement is indicated in the Airport Data Sheet (Displaced Threshold = "none" in Airport Data Sheet). Once it is determined whether the east 200 feet of Runway 28C/10C is displaced or moved, verify the appropriate markings are depicted on the future ALP. Additionally, the narrative describing this future runway in the Project Definition Report (p. 8) incorrectly identifies the runway length as 12,600'. There are also no coordinates listed for the Runway 28C displaced threshold (Future Runway End Coordinates table) and the elevation needs to be verified. Is the 650 feet referring to the displaced threshold or end elevation? Please verify for accuracy all coordinates and facility dimensions in the narrative and on the drawings prior to next ALP submittal.	Runway coordinates and lengths checked and updated per comment. 28C threshold moved back to edge of runway pavement.

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Runway Coordinate Analysis Table				
Runway	**Length (Future ALP)**	**Length (Per coordinates)**	**Length Difference (future ALP vs. coordinates)**	**Azimuth Difference (future ALP vs. coordinates)**
Existing/Future 4L/22R	7,500'	7,520.5'	20.5'	17"
Existing/Future 4R/22L	8,071'	8,091'	20'	13"
Existing 9L/27R	7,966'	7,989'	23'	41.5"
Existing 9R/27L	10,141'	10,146'	5'	12.5"
Existing 14L/32R	10,003'	10,028.6'	25.6'	6"
Existing 14R/32L	13,000'	13,021.5'	21.5'	8"
Existing 18/36	5,341'	No coordinates	No coordinates	No coordinates
Future 9L/27R	7,500'	7,500'	0	13.6"
Future 9C/27C	11,245'	11,240'	5'	5"
Future 9R/27L	11,260'	11,261.5'	1.5'	7"
Future 10L/28R	13,000'	13,001.6'	1.6'	1.1"
Future 10C/28C*	10,600'	10,600'*	0	0
Future 10R/28L	7,500'	7,500'	0	11"

*Runway 28C coordinate appears to be for the displaced threshold, not the runway end

d.	Elevations are depicted approximately 500' from each runway end on the Existing ALP Sheet 2. What does this elevation represent? They do not match the touchdown zone elevations depicted in the Data Tables.	These elevations have been modified to correctly represent the touchdown zone elevations and have been matched with the TDZ elevations detailed in the data table
e.	Please provide elevation information for the touch down zones on the Future ALP Sheet 3.	Touchdown zone elevations now shown on

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		future ALP
f.	Elevation Runway 4L (656.0') does not match the elevation in the RPZ table (655.5') or the existing end elevation (655.5') as shown on Existing ALP (Sheet #2)	4L-22R elevations now matched between airport layout plan and airport data sheet
g.	Existing airport elevation (668') is based upon the highest elevation of existing Runway 14R/32L. When this runway is decommissioned, the airport elevation will be based upon the highest elevation of future Runways 10L/28R and 10C/28C (666'). Therefore, the future airport elevation should be 666'.	Highest runway elevation on future airfield will be 668.3' (future runway 9C-28C) compared to 667.7' on existing (14R-32L). Airport elevation to the nearest foot for both existing and future airfields is 668'
A-44)	Since construction cost is the criteria used in the Concept Development/Refinement report for establishing runway elevation, the runway elevations should be based upon balanced earthwork. The discussion regarding runway elevations seems to be based upon the assumption that any runway with vertical alignments above existing ground will increase costs. This is a difficult question since a runway centerline set at existing ground surface would require substantial excavation to allow for pavement structure and lateral slopes to facilitate drainage. However, since the proposed runways will require removal of site demolition and clearing materials, the buildable site elevation is less than the existing surface. Even so, the Utilities Notebook (page 11-17) states that there is 4,000,000 CY of material to be excavated from the south storm water basin and stockpiled for use in the OMP. If Runways 10C/28C and 10R/28L are designed to closely approximate existing ground for economy of construction, the 4,000,000 CY of stockpiled excavation material may need to be hauled off site at considerable expense.	Earthwork balancing will be evaluated in detail during engineering design. Depending on the suitability of excavated materials from the drainage basins and the runway development, excess fill may be available; however the extent of this material is unknown at this time. For ALP purposes, the existing ground profile and runway end elevations were assumed to provide the greatest (e.g., most conservative) airspace protection and reasonable earthwork balance.
A-45)	In order to maintain existing/and or expand IFR operations at this airport, refer to AC/150-5300-13, appendix 16,table a16-1a/precision or table a16-1b.	Future facilities intended for use during IFR operations meet the requirements of AC150-5300-13, Appendix 16, table a16-1a and table a16-1b
A-46)	Provide future Simultaneous ILS operations. This information is required to supplement procedure design. Simultaneous ILS procedures must meet the requirements of 8260.3B Change 19, Volume 3, Appendix 2.	Future facilities intended for use during IFR operations meet the requirements of Order 8260.3B, Change 19, Volume 3, Appendix 2, or are subject to an operational restriction
A-47)	Prior to the future ALP approval AC 150/5300-13, change 8, Airport Design, will be in effect, thus its standards must be reflected in the next ALP submittal.	Draft change 8 not yet available. Change 8 to be reflected in subsequent ALP revisions.
A-48)	Runways 9L-27R (400'-500'), 10R-28L (400'), 9R-27L (365'-400'), and 10L-28R (400'-500'): For ILS Category II and III operations, runway to taxiway centerline separation of 500	Future Runway 10R-28L parallel taxiway separation increased to 500'. Future

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	feet is required for aircraft design group V and 600 feet is required for design group VI. Constructing any portion of the taxiway less than 500 feet will restrict design group V aircraft and/or require the minimums to be raised. Flight Standards TERPS TIL-00005A paragraph 4.1.1c(3) requires a collision risk assessment on any operations not meeting the minimum runway/taxiway separations.	runways 9R-27L and 10L-28R parallel taxiway separations are existing conditions and subject to collision risk assessment to determine any required restrictions for CAT II/III operations. Future runway 9L-27R partial parallel taxiway separation is constrained by site conditions and cannot be increased from 400'. The portion of taxiway at 400' will be subject to an operational restriction during CAT II/III operations (included in Appendix A) pending the outcome of collision risk modeling.

FREQUENCY ANALYSIS

Ref. No.	Comment	Response
A-49)	An extensive Navigational Aids frequency allocation study will have to be performed by the FAA; frequency allocation options in the Chicago area are extremely limited.	FAA Action.
a.	An extensive Navigational Aids frequency allocation study will have to be performed before an operational ILS frequency plan can be made for implementation of the runway configurations as proposed in the OMP. Very High Frequency (VHF) Localizer frequencies are extremely limited. Presently, 34 out of 38 available frequencies are in use within 60 nautical miles of O'Hare International Airport (ORD). The radio frequency environment surrounding ORD is exceedingly complex and limits which of the 38 frequencies can be assigned at ORD.	(See general comment under A-49)
b.	Results of an extensive NAVAID frequency allocation study may indicate the following:	(See general comment under A-49)
i)	Some ILS runway approaches may require use of radar.	(See general comment under A-49)
ii)	Spectrum Engineering requests that the course width be not more than plus or minus 6 degrees from runway centerline.	(See general comment under A-49)
iii)	Only east/west runway ILS will use DME. These runways as proposed on the future ALP are to be CAT II and III.	(See general comment under A-49)
iv)	The plan will require Spectrum Engineering to change ILS/DME frequencies at other airports away from O'Hare in order to provide ILS/DME as requested on the 6 East – West runways. The ILS/DME frequency change impacts due to the expansion of O'Hare International Airport will require mitigation and the costs of making these ILS/DME frequency changes at other airports may have to be covered by the sponsor.	(See general comment under A-49)
v)	Specific ILS approaches may have to be restricted if interference is predicted or the operation on these approaches will have to be mitigated in other ways, i.e. use of radar.	(See general comment under A-49)
vi)	The navigational aid frequency allocation study will require revising as each phase of the OMP is implemented.	(See general comment under A-49)
c.	After the new runway 9L-27R is added in Phase 1A, ILS/DME frequency assignments for new east-west runways may require shutdown of ILS/DME NAVAIDs on runways 14L-32R and 14R-32L. These frequencies may be required to establish ILS/DME NAVAIDs for new 9-27 and 10-28 east-west runways after 9L-27R is established. The period for 14L-32R and the 14R-32L NAVAID shut down is critical for the assignment of ILS/DME frequencies at the	(See general comment under A-49)

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	other new future east-west runways during the later phases of the O'Hare Modernization Program.	
A-50)	The OMP as proposed, removes the present O'Hare RTR sites and requires new RTR facilities to be constructed. This may require site relocation of present O'Hare ATCT, Elgin TRACON, and ZAU ARTCC frequencies presently located on O'Hare International Airport. Relocation of these frequencies may require new off airport sites depending on how the air traffic flow will be managed and to maintain frequency operational compatibility.	FAA Action.
A-51)	The OMP as proposed requires additional communication channels (frequencies). Specifically, additional local control VHF frequency and additional ground control VHF frequency for an ATCT and additional VHF frequencies for the TRACON. All of these additional air/ground communication channels must be found within in the present FAA air/ground Spectrum allocation. Due to frequency congestion in the Chicago Metropolitan area, an extensive air/ground frequency study will be required to generate an air/ground frequency plan with sufficient spectrum to support the Air Traffic proposed operational requirements. This frequency plan may require changes in existing frequency assignments both, en-route and control tower, over a wide area including airspace control frequencies nationally. This frequency plan may require both National and International coordination.	FAA Action.

COMMUNICATIONS

Ref. No.	Comment	Response
A-52)	The modernization of the O'Hare International Airport, as depicted on the subject future ALP, will require the relocation of all existing O'Hare Remote Transmitter/Receivers. Impacts to FAA facilities and infrastructure due to the future expansion of the O'Hare International Airport will require mitigation, the costs of which will be covered by the sponsor through reimbursable agreement with the FAA. A complete evaluation of the communication plan for O'Hare ATCT, TRACON and ARTCC as it relates to the planned airport development must be completed before we can fully identify the extent of these impacts. Costs may include work both on and off airport property, additional equipment and infrastructure, and phasing the placement of communication facilities on an interim or final basis. No existing communication or fiber facilities or infrastructure will be removed from service or impacted by airport development without prior coordination with the FAA and new or interim communication services and/or facilities being in place and ready for operation. A suggested set of replacement facilities was presented to the proponent and are depicted on the future ALP with the following exceptions:	Communications studies to be completed by FAA. Any required changes resulting from these studies will be incorporated at a later date. The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA to manage facility relocations and conduct detailed phasing studies to minimize impact to FAA facilities.
a.	<u>Existing Communication Facilities</u>	
i)	RTR ORD is presently located in the area identified as the future location of the West Terminal Satellite Concourse (T4) and will require relocation. FAA requests additional information on the future concourse building to be used for further evaluation of its potential as a home for a replacement co-located communication site.	RTR-ORD is planned for relocation to the top of the west satellite concourse. Additional building information is currently unavailable. Detailed siting evaluation will take place during engineering design. The City of Chicago's O'Hare Modernization Program Office will continue to coordinate with the FAA on RTR relocation.
ii)	RTR-A will require relocation due to its proximity to the future Runway 10R/28L. An interim and/or final location for the equipment and services provided from this facility must be identified and evaluated.	Replacement RTR facilities have been identified and are shown on the future ALP
iii)	RTR-B will have to be relocated due to its proximity to the future Runway 10C/28C. An interim and/or final location for the equipment and services provided from this facility must be identified and evaluated.	Replacement RTR facilities have been identified and are shown on the future ALP
iv)	The future ALP shows a four level rental car facility at that location P3 requiring the removal or relocation of RTR-C. This impact was not identified in early planning documentation. This	Replacement RTR facilities have been identified and are shown on the future ALP.

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	parking structure is identified as "unphased". FAA can only assume that this indicates that this portion of the plan has yet to be tied to the Phasing Plan. Early planning documents did not indicate any work, which would place current RTR-C (feature 902) in jeopardy. The frequencies currently housed in RTR-C must be relocated as a result of planned construction. While it may be possible that communication facilities from RTR-C can be accommodated in other RTR sites, there is no guarantee. This particular item requires resolution. The FAA requests additional details on the plans for this parking area for further evaluation. An interim and final location for the equipment and services provided from this facility must be identified and evaluated.	The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA on facility relocation phasing.
v)	RTR-D will require relocation due to the construction of terminal #4. An interim and/or final location for the services provided from this facility must be identified and evaluated.	Replacement RTR facilities have been identified and are shown on the future ALP. The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA on facility relocation phasing.
vi)	The ORD RCAG (listed as RTR-F) will penetrate the 7:1 transitional surface of Runway 9L/27R, therefore requiring relocation. An alternate site is not identified on the future ALP. A new site must be located and evaluated. If the alternate site is on airport, it should be identified on the future ALP.	Replacement RTR facilities have been identified and are shown on the future ALP.
vii)	No automatic assumptions should be made regarding the ability of existing facilities to accommodate equipment and services from communication facilities targeted for removal from the airport. Further evaluation and planning will be required, as staging plans become more specific for airport development.	The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA on facility relocation phasing.
viii)	The site referred to as future RTR-T may be collocated with the existing Airport Traffic Control Tower (feature 402). It should be depicted on the future ALP in some way if such depiction is appropriate.	Replacement RTR facilities have been identified and are shown on the future ALP.
ix)	A site referred to, as future RTR-U will need to be accommodated in the West Terminal Satellite Concourse (BLDG. T4 on the future ALP). Space must be reserved for this facility and should be depicted on the future ALP in some way if such depiction is appropriate.	RTR facilities are depicted on top of the west satellite concourse on the future airport layout plan
b.	<u>Future Communication Facilities</u>	
i)	Further evaluation will be required to determine on and off airport impacts to communication facilities directly or indirectly impacted by the configuration at the airport. Additional work or facilities may be required off the airport in support of Chicago ATCT, TRACON or ARTCC requirements to properly provide air traffic services. When the communication plan for	FAA communications and instrumentation frequency studies to be completed by the FAA. Any required changes resulting from these studies will be incorporated at a later

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	O'Hare ATCT, the TRACON and ARTCC air traffic control operations are further defined and coverage and frequency plans are studied, it will be determined if the conceptual locations of communication facilities are adequate or if any alternate facilities may be required. The costs of work both on and off airport will be the responsibility of the airport to cover through the reimbursable agreement.	date.
ii)	Four new RTRs are depicted to the northwest (RTR-P), the northeast (RTR-Q1), the southwest (RTR-R) and the southeast (RTR-S). The OMP supports the requirement for two additional RTRs in the area of the West Terminal Concourse (RTR-U) and the existing ATCT (RTR-T). Space and funding should be reserved for the construction of RTR-U and RTR-T, associated towers and infrastructure in the event that a co-location of facilities cannot be accommodated. Both locations should have references on the future ALP as planned RTR locations.	RTR-U facilities are depicted on the west satellite concourse on the future airport layout plan. It has been determined by the NAVAIDS Working Group that an additional site for RTR-T will not be required.
iii)	We request details on both the concourse (T4) and parking structure (P3), as they become available for possible incorporation of FAA collocation requirements. These might be candidate sites for co-located facilities. Space, power, utilities, cabling and antenna location may be completed in conjunction with airport work if facilities are acceptable to FAA requirements.	Additional information on these facilities is currently unavailable. Additional siting evaluation will take place during engineering design. The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA on communications facility siting requirements.
iv)	RTR-Q1 is shown too close to existing Runway 14L/32R. The facility should be shifted away from the runway to avoid penetration of the transitional surface of the existing Runway 14L/32R. Antenna towers for this site are estimated at 60' plus the addition of antennas and lightning protection, which brings the overall height to approximately 75'. The placement of the site and phasing with respect to removal of 14L/32R will be important.	The City of Chicago's O'Hare Modernization Program Office is conducting detailed phasing studies and will work closely with the FAA on facility relocation phasing.
v)	RTR-S location must be evaluated with respect to the timing of RTR-A and RTR-B removals, and shortening of Runway 14R/32L. Placement and timing will be important with respect to the removal of 14R/32L.	The City of Chicago's O'Hare Modernization Program Office is conducting detailed phasing studies and will work closely with the FAA on facility relocation phasing.
vi)	Additional equipment and materials may need to be obtained to support the new or transitional communication or fiber requirements associated with the airport development and in the mitigation of any operational impacts.	The City of Chicago's O'Hare Modernization Program Office is conducting detailed phasing studies and will work closely with the FAA on facility relocation phasing.
vii)	Detailed integrated scheduling for the construction of all new communication facilities must	The City of Chicago's O'Hare

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	be developed to ensure services are continued without disruption. The FAA may determine that some work can be consolidated with airport activity. Details of this nature and associated responsibilities will be outlined in the future reimbursable agreement with the airport.	Modernization Program Office is conducting detailed phasing studies and will work closely with the FAA on facility relocation phasing.
viii)	Fiber optic cables, ductwork, conduit and equipment requirements must be included/planned for connecting all the new communication facilities to the existing ATCT and two future ATCTs.	The City of Chicago's O'Hare Modernization Program Office is conducting detailed phasing studies and will work closely with the FAA on facility relocation phasing.
ix)	Further planning will be required within the FAA and with the airport to determine specific plans and timing of when new fiber network requirements need to be in place. The FAA will determine where and when new fiber optic capabilities must be established prior to any impact to the existing Fiber Optic Transmission System (FOTS) infrastructure.	The City of Chicago's O'Hare Modernization Program Office is conducting detailed phasing studies and will work closely with the FAA on facility relocation phasing.
x)	Two separate manholes must be provided for physical diversity of power, control, and communication cables, etc. for each new communication facility.	The City of Chicago's O'Hare Modernization Program Office will coordinate with the FAA to incorporate design requirements during engineering design of facilities
xi)	The airport must construct access roads, grading and sub-surface work to and for each new communication site.	Access to FAA facilities will be provided and has been depicted on the future airport layout plan
xii)	Fiber Optic Transmission System (FOTS) presence at ORD. The established FOTS systems provide operational service communications between on airport FAA sites and the ORD Airport Traffic Control Tower (ORD ATCT). Further, it is important to establish awareness as soon as possible, that construction activities must consider first the existing FOTS infrastructure, then new and/or revised runway and site transitions. Listed below are some items to keep in mind prior to construction:	The City of Chicago's O'Hare Modernization Program Office is conducting detailed phasing studies and will work closely with the FAA on minimizing impacts to existing FOTS infrastructure and implementation of new infrastructure
1)	All FAA operational on airport services, between the ORD ATCT and navigational aids, radio transmitter, or radar site locations are provided over a FOTS system.	Comment noted
2)	There is a future FOTS plan, in association with the OMP and any runway construction activities should consider associated FOTS requirements (e.g., conduit, duct, and fiber optic cable and equipment requirements).	Comment noted

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	In addition, any runway or site relocation (e.g., LOC, GS, ALSF, MALSR, ASR-9, and RTR) presently connected via a FOTS system, will need to be established at the new location before disconnection occurs at the current location. The duct or conduit will be traceable back to the ORD ATCT. Fiber Optic Cable and FOTs Equipment will be used for all Federal Aviation Administration (FAA) on airport operational services between the ORD ATCT and FAA Sites.	
3)	Construction activities, especially from Runway 9L/27R and south, may put fiber Optic Cable at risk. Damage to cable; will result in loss of service.	Comment noted

AIRCRAFT RESCUE AND FIREFIGHTING

Ref. No.	Comment	Response
A-53)	The depicted number and location of ARFF stations do not appear to be sufficient to meet minimum 14 CFR part 139 response times. Under the existing configuration of the airport, Runway 18/36 is not authorized for air carrier use due to ARFF response times that have exceeded current 14 CFR part 139 requirements. The future Runway 9L/27R is located considerably farther from the current Runway 18/36. In addition, the ARFF response time to Runway 10R/28L could also present ARFF response difficulties from the current Rescue Station #1. While we cannot definitely say how many airside ARFF facilities will be necessary to meet 139 requirements, it would appear that a minimum of 4 airside stations would be necessary in the ultimate future development. It is important to point out that maintaining minimum requirements, in terms of ARFF facilities and response capabilities should not necessarily be viewed as the standard for an airport with the current and projected activity levels of ORD. As a large international airport and in the interest of public safety, we would support ORD in designing the ARFF response capabilities in accordance with the International Civil Aviation Organization (ICAO) ARFF response recommendations. ICAO ARFF recommendations suggest "The operational objective of the rescue and firefighting service should be to achieve response times of two minutes, and not exceeding three minutes, to the end of each runway as well as to any other part on the movement area, in optimum conditions of visibility and surface conditions." It is also strongly recommended that an ARFF response study be conducted to establish the necessary station layout. Consideration of airfield complexity and traffic flow should also be factored into the evaluation. The FAA will not certify any air carrier runway unless the City of Chicago can consistently meet the minimum ARFF response times outlined in FAR Part 139.319(i)(2). The FAA Certification Safety and Standards Branch (AGL-620) requests to be directly involved in the planning phases of these stations to ensure that minimum ARFF response times can be met prior to the commissioning of all new air carrier runways.	See Appendix B for details of ARFF response study for future airfield. Dedicated ARFF response routes added to the north and south airfield to ensure FAR Part 139 compliance. Additional study will occur relative to appropriate ARFF locations to meet ICAO requirements when and if those requirements are formally adopted by the FAA.
A-54)	It may be necessary to relocate the ARFF Training Facility off-airport. The ARFF training facility must provide vehicle and personnel access and egress without crossing or utilizing aircraft movement areas. In addition, this facility must be situated in a location that is not limited by potential operational restrictions to the Future Runway 9L-27R due to smoke obscuration.	A future service road will provide access to the facility from the east, connecting with the perimeter road. This service road will cross the north-south taxiway connector from the 27L end. There are clear sight-lines in this area and the majority of traffic will be CFD and DOA vehicles with tower contact. This is considered a preferable solution to the significant expense of

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		relocating the facility. Smoke from the facility is considered unlikely to obscure the 27R approach from the North ATCT, but should this become a concern the training facility could restrict burning during operations on 9L-27R.
A-55)	We request identification and evaluation of detention alternatives not involving on-site, on surface facilities to assist in ARFF (see also comments under "Wildlife"). With steep side slopes and significant depth as presently depicted, the detention facilities appear inimical to timely and effective ARFF response.	A detailed analysis of stormwater detention alternatives has been completed and submitted to the FAA under separate cover. The preferred alternative identified in this study is shown on the Future ALP drawing. The City of Chicago's O'Hare Modernization Program Office will work closely with the FAA and USDA Wildlife Services to ensure that adequate wildlife mitigation measures are implemented and that ARFF equipment is available to meet FAA water rescue response requirements.

GROUND VEHICLE SERVICE ROADS

Ref. No.	Comment	Response
A-56)	Provide information, in drawing format, on which perimeter roads are removed, constructed, or are to remain as they currently exist and their relation to the airport operations area. This information should be shown both on the future ALP and on a separate drawing. It may also be helpful to distinguish those roads on the airport versus those roads off airport. Roadway information should also be provided on access roads and gates for current and future FAA facilities.	An Ultimate Phase Concept Plan has been provided illustrating future service roads consisting of existing or portions of existing roads, upgraded roads and future roadways. Roadways include dedicated snow service, ARFF access and NAVAID access roads. The drawing does not show any portions of existing service roads that will not be required in the ultimate configuration.
A-57)	In exhibit 16, the future runway configuration for 9R/27L shows the existing service road crossing the runway. The future ALP does not indicate that this road will be removed. If the road is remaining, the future ALP does not identify what measures will be taken to prevent runway incursions.	Service road will be removed. An Ultimate Phase Concept Plan has been provided to illustrate the planned future service road system.
A-58)	Show access roads for the navigational aids on the future ALP. They must be mutually acceptable for both the Department of Aviation (DOA) and FAA. FAA was unable to evaluate the availability of adequate facility access.	Access roads to Navigational Aids provided per comment
A-59)	A complete perimeter road system must be included in this plan which will keep all vehicles off all movement areas except for those vehicles that must access movement areas due to activities such as: inspections, maintenance, snow removal, and emergency response. All non-essential vehicles must have access to a service road system to prevent unnecessary runway crossings. This is a necessity for runway incursion prevention in addition to providing a necessary ARFF access road system. Access roads must be provided behind each and every runway located outside Runway and Taxiway Safety Areas.	Service road plan has been updated to include a perimeter road system. NAVAID and ARFF access roads have been provided per comment. Except as noted in the Approach/Part 77 drawings, no service road penetrates Part 77 primary surfaces.
A-60)	A vehicular traffic study is needed to determine if the future on airport vehicle roadways (perimeter/service) will be sufficient to handle the projected traffic. Specific concerns exist with the additional traffic associated with the West Terminal complex to the main terminal core.	Service road traffic study has been completed and will be provided as a separate document
A-61)	Any new vehicular roadway should be tunneled if it crosses an aircraft movement area.	New roadways have been tunneled/depressed under aircraft movement areas where practical.

Ref. No.	Comment	Response
A-62)	The service road bridge depicted on the east side of the future ALP that crosses the expressway is strongly supported and should be installed with Phase 1A of the airport development. This service road is necessary to provide for the current and expanded level of vehicular traffic, which support the operations on the north side of the airfield.	Service Road bridge is currently planned for Phase 2.
A-63)	Service road access to Explosive Chamber, R1 is needed and should be clearly depicted.	Access to the explosive chamber has been added to the future airport layout plan

COMPLEX INTERSECTIONS

Ref. No.	Comment	Response
A-64)	Eliminate intersections with large pavement areas where several taxiways and/or runways come together at a single point and keep the intersections perpendicular except for high-speed exit taxiways where required. These areas can be confusing to pilots and a potential for runway incursions. Examples: Phase 1A, the area of runway 9L/27R, along with its parallel taxiway, at the point they cross existing runway 14L-32R and taxiway P. Phase 1B, the new eastbound high-speed taxiway at the point it crosses existing runway(s) 9L-27R and 14R-32L. Phase 1C, new eastbound high speed as it crosses existing runway 14R-32L. Just to the west of that location where an eastbound and westbound high speed come together. Phase 2A where extension to existing runway 9L-27R and its parallel taxiway all come together with the taxiway leading north out of the satellite ramp and existing runway 14R-32L	Intersections with large pavement areas that have the potential to create complex intersections have been eliminated or reduced to the greatest extent possible while maintaining operational requirements. Runway 14R-32L and 14L-32R are eliminated by the O'Hare Modernization Program and thus the complex intersections referred to in Comment A-64 will be removed. The City of Chicago's O'Hare Modernization Program will evaluate interim phases and work with the FAA to minimize complexity at intersections
A-65)	All abandoned pavement created, as a result of this construction project must be completely removed.	Abandoned pavement will be demolished within the Object Free Areas. The City of Chicago's O'Hare Modernization Program Office will consider the disposition of abandoned pavement located outside the OFA throughout each interim phase of construction.

WILDLIFE

Ref. No.	Comment	Response
A-66)	Prior to commencing any construction related to development in the OMP, the City of Chicago shall complete a wildlife hazard assessment (WHA) to evaluate each separate phase of the construction plan. USDA Wildlife Services is an acceptable party to conduct this assessment based on their expertise with animal damage control at airports, in addition to their specific expertise at O'Hare. If the WHA is not conducted by USDA Wildlife Services, AGL-620 will need to be consulted to evaluate the qualifications of the person(s) conducting the assessment prior to approval.	Subsequent consultation with USDA by FAA has determined that an updated or revised Wildlife Hazard Assessment (a.k.a.Ecological Study reference 14CFR Part 139.337) will not be necessary as it relates to the O'Hare Modernization Program Phasing. The City of Chicago O'Hare Modernization Program Office will coordinate OMP construction phasing with the USDA. Wildlife Service to ensure the Wildlife Hazard Management Plan and program modified and updated as necessary.
A-67)	As communicated in a letter to the City of Chicago on January 23, 2003, the FAA requests an evaluation of alternatives not involving on-site, on the ground detention facilities. Alternatives to the current planned detention facilities should minimize the potential for wildlife attraction while also minimizing the risks for aircraft operating on the airfield. As a related matter, we take this opportunity to note that our letter of January 23, 2002 also referenced the FAA policy not to locate wildlife attracting compensatory wetlands near runway ends. The disposition of off-site below ground facilities should be included in the next ALP submittal.	See response to comment A-55

TRANSPORATION SECURITY ADMINISTARTION

Ref. No.	Comment	Response
A-68)	All new facilities must have an adequate infrastructure to accommodate an access control system as well as personnel screening facilities since all new construction will either be contained within, or provide access to, the secured area of O'Hare International Airport.	TSA and FAA security requirements will be incorporated during engineering design.
A-69)	Terminal and cargo buildings must be designed with sufficient space to handle screening equipment for passengers, employees, baggage and cargo.	TSA and FAA security requirements will be incorporated during engineering design.
A-70)	Relocation and modification of perimeter gates must be designed to accommodate an area where screening of vehicles and occupants can take place.	TSA and FAA security requirements will be incorporated during engineering design.
A-71)	The increase in the number of employees will necessitate additional capacity in the access control and identification badge computer systems.	TSA and FAA security requirements will be incorporated during engineering design.

B-PHASING COMMENTS

PHASE 1 GENERAL COMMENTS

Ref. No.	Comment	Response
B-1)	Runway 14L Instrumentation. In order to maintain CAT II/III, the following are some of the actions that need to be taken.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency.
a.	Runway 14L Glide Slope and Touchdown RVR. If the excavation of the Detention basin begins (detention basin locations have not been approved), the glide slope and the touchdown RVR will be removed from service.	(See general comment under B-1)
b.	Runway 14L Mid-RVR. Damage to the Midfield RVR power and control cable during excavation is possible. Promptly repair as necessary.	(See general comment under B-1)
c.	Runway 14L ALSF-2.	
i)	Reconstruct the regulator substation 650 feet north of Runway 9L-27R centerline, more than 400 feet southwest of Runway 14L centerline, and about 1,350 from 14L threshold.	(See general comment under B-1)
ii)	The regulator substation building will be under the Runway 9L-27R 14 CFR part 77, 7:1 transitional surface.	(See general comment under B-1)
iii)	Frangible steady-burning light bars will be in the Runway 9L-27R RSA and OFA, from threshold bar out to and including the station 7+00 bar. No flashers or flasher ICCs will be in the Runway 9L-27R RSA and OFA.	(See general comment under B-1)
iv)	Light bars falling on Runway 9L-27R will have to be semi-flush.	(See general comment under B-1)
v)	Construct the parking area around the ALSF-2 without disturbing the ALSF-2. Complete the parking area when the ALSF-2 is decommissioned. Do not permit penetration of the approach light plane.	(See general comment under B-1)
d.	Runway 14L Inner Marker. The IM antenna will be outside the Runway 9L-27R RSA and OFA, and will be about 500 feet off Runway 9L-27R centerline.	(See general comment under B-1)

Ref. No.	Comment	Response
e.	Runway 14L Localizer FFM. Continue to use the existing FFM antennas that are at the middle marker site. All control cable routes shall be preserved or new routes shall be established.	(See general comment under B-1)
f.	Runway 14L Rollout RVR. Do not disturb the existing rollout RVR, located at the existing Runway 32R glide slope site.	(See general comment under B-1)
g.	Runway 14L Localizer. Do not disturb the existing localizer, which is about 950 feet from the landing threshold of Runway 32R.	(See general comment under B-1)
B-2)	Additional information will be needed to evaluate the phasing of 14R-32L, specifically as it pertains to the relocated or displaced threshold.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency.
B-3)	The pavement modifications to Runway 14L are not clearly depicted; specifically the 1200' relocation or displacement needs to be clearly identified. In addition, if Runway 14L approach is relocated to the SE due to the construction of Runway 9L-27R, access to the 14L approach should be identified.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency.
B-4)	Runway 14L-32R will be temporarily closed, but only pavement near the new Runway 9L-27R is shown to be removed. We understand that Runway 14L-32R will be temporarily reopened after Runway 9L-27R is built, until the commissioning of Runway 9C-27C (Phase 2B). This may create a confusing condition with runway incursion potential at the Runway 14L end. What is the intended future use/disposition of this pavement after Runway 14L-32R is closed? It would appear that all of the runway pavement will be removed and no future taxiway use is planned.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency.
B-5)	Runway 14R Instrumentation: In order to maintain Cat-II/III; do not disturb the existing ILS, ALSF-2, and RVR facilities serving Runway 14R. Also, do not construct any objects that would jeopardize the use of Runway 14R.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum

Ref. No.	Comment	Response
		efficiency.
B-6)	At the bottom of Page 75 of the "Project Definition Report", there is an incorrect operational assumption that "The future GS-RVR Building will be temporarily relocated to enable the use of Runway 14R-32L." The future GS-RVR building referred to must be the Runway 9R GS-RVR building. The 9R glide slope has to be installed with the antenna mast 1,050 feet from 9R threshold and 400 feet from 9R centerline. The antenna mast will be only about 15 feet from the edge of the Runway 14R southwest shoulder. The 9R glide slope building will be on the shoulder. The touchdown RVR will be on the Runway 14R pavement. A portion of 14R shoulder and runway pavement will have to be demolished in order to construct the 9R glide slope and RVR.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency. The future 9R glideslope conflict with 14R-32L will be resolved through this process.

PHASE 1A- RUNWAY 9L/27R

Ref. No.	Comment	Response
B-7)	Runway 9L Instrumentation:	
a.	Trains on the railroad tracks may be a concern for glide slope performance. Further study is required and must be done under a reimbursable agreement between the FAA and Sponsor.	Glideslope interference study in progress. Any required changes resulting from this study will be incorporated at a later date
b.	The ALSF-2 light lane as proposed crosses the railroad tracks where the tracks are narrow.	See Comment B-7c
c.	Due to the railroad, a non-standard light bar interval about 1500' from threshold is noted on the future ALP. Corrective action will be required. A railroad grade crossing will not be required, since access to the light lane will be possible and easy from both sides of the tracks. West of the tracks, access will be via Higgins Road and one of the side streets leading into the existing industrial park.	9L ALSF-2 light bar stationing adjusted per FAA comments and discussions at NAVAID working sessions. Light bar stationing has been adjusted to clear railroad alignment per standards, access routes have been detailed, and 23' min. clearance above track elevation has been verified. (ground survey has been completed for railroad track under the approach light plane of 9L, confirming minimum clearance achieved).
d.	FFM antennas are not fixed by function, and cannot be sited in the runway safety area. FFM antennas should not have ground traffic in front of them. Therefore, relocate the service road to run through the ALSF-2 about 1,230 feet from Runway 9L threshold. This will create a viable FFM siting area between the service road and the end of the RSA.	Service road re-aligned. FFM antennas located per FAA comment and discussions at NAVAID working sessions.
B-8)	Runway 27R Approach and Runway 22R Instrumentation:	
a.	The Runway 27R glide slope location is depicted incorrectly on the future ALP in relation to the runway centerline. In accordance with FAA Order 6750.16C, Siting Criteria for Instrument Landing Systems, Paragraph 27.c., Category II and III glides slopes should be located at a minimum distance of 400 feet from the runway centerline. It has been observed that to make all elements of the glide slope facility (antenna mast and building) clear the runway Object Free Area (OFA) the facility would have to be centered 407 feet off runway centerline.	Glideslope lateral siting changed to 407' from runway centerline. Glideslope longitudinal siting adjusted per criteria to preliminary runway profile. Glideslope now sited at 1,113' from runway threshold with resultant TCH of 55'.
b.	The Runway 27R ALSF-2 as proposed, will cross several roads, creating a non-standard light bar interval. The current ALP configuration prevents standard installation of the ALSF-2 equipment. Corrective action will be required to meet current FAA standards.	27R ALSF-2 light bar stationing adjusted per FAA comments and discussions at NAVAID working sessions. Light bar locations and road alignments have been

Ref. No.	Comment	Response
		adjusted to allow standard stationing, and access routes have been detailed.
c.	The outermost light bar of the Runway 27R ALSF-2, as proposed, will have to be at the same elevation as the outermost flasher of the Runway 22R MALSR.	Outermost light bar of 27R ALSF-2 and outermost light bar of 22L MALSR can be achieved with standard approach light profiles of ALSF-2 and MALSR. This will be addressed during engineering design
d.	The alignment of the Bessie Coleman Extension and its on-ramp to I-90 eastbound as shown on the future ALP, are incompatible with the 27R ALSF-2 and the 22R MALSR and create a non-standard condition. Corrective action will be required to meet current FAA standards. These designs must be coordinated, with the design of the extension of Bessie Coleman Drive accessing I-90, and its on-ramp to I-90 eastbound.	9L ALSF-2 light bar stationing adjusted per FAA comments and discussions at NAVAID working sessions. Light bar locations and road alignments have been adjusted to allow localizer siting at 1,010' from threshold, per standard stationing criteria, and access routes have been detailed. Bessie Coleman alignment has been adjusted to avoid 22R MALSR light bars.
e.	The FAA was unable to identify an acceptable siting location for the Runway 27R localizer FFM antennas. The best FFM antenna site would probably be about 1,250 feet from threshold. At that site, the ALSF-2 light plane could be about 21 feet high. If the FFM antennas were 20 feet high, they would look over the vehicular traffic on the service roads in front of them, and they would be under the approach light plane.	27R FFM antennas located per FAA comment and discussions at NAVAID working sessions.
B-9)	North Detention Basin: Runway 14L Glide Slope and Touchdown RVR. If the excavation of the Detention basin begins, the glide slope and the touchdown RVR will be removed from service.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency.
B-10)	Air Traffic Control Tower:	North ATCT siting study complete and recommended site shown on future airport layout plan. Provisional south ATCT site shown on future plan. This site is subject to change based on completion of detailed siting study.

Ref. No.	Comment	Response
a.	The requirement for two additional Airport Traffic Control Towers (ATCT) is valid from a line of sight perspective. The FAA will determine and approve the appropriate locations.	(See general comment under B-10)
b.	The new ATCT site must meet FAA Order 6480.4, Air Traffic Control Siting Criteria.	(See general comment under B-10)
c.	The City of Chicago, Department of Aviation must submit an ATCT Siting report indicating the following information:	(See general comment under B-10)
i)	Distance and depth perception to runway ends.	(See general comment under B-10)
ii)	Maximum To Avoid (MTA) elevations at each site.	(See general comment under B-10)
iii)	Shadow studies at each site.	(See general comment under B-10)
iv)	Look down angle radius at each site.	(See general comment under B-10)
v)	A narrative for the new sites addressing sunrise and sunset impacts, glare and light reflection impacts and employee access.	(See general comment under B-10)
vi)	The new sites must be large enough (2+ acres) for employee parking, Government Owned Vehicle (GOV) parking, a base building and support equipment.	(See general comment under B-10)
d.	The ultimate location and characteristics of the North and South Air Traffic Control Towers (ATCT), will not only need to take into account ATCT line-of-sight requirements, but will also need to consider it's impact to TERPS surfaces. Including CAT II/III Obstruction Clearance Criteria. Under a preliminary study conducted by the city in coordination with the FAA, there was impact to both current and future instrument approach procedures. Under this study two sites were selected, site 1 and site 5A. Our evaluations of each site was:	(See general comment under B-10)
i)	Site 1: 41° 59′ 40.955″N/087° 55′ 10.604″W, 881 Above Mean Sea Level (AMSL), 221 Above Ground Level (AGL), this site would result in a 40' MDA increase to the RNAV (GPS) approach to Runway 22R, it would also impact any planned usage to Runway 14L/14R after the ATCT is constructed.	(See general comment under B-10)
ii)	Site 5A: 41° 59′ 45.01″N/087° 54′ 55.639″W, 881AMSL, 221AGL, this site would result in a 60' MDA increase to the RNAV (GPS) approach to Runway 22R, it would also impact any planned usage to Runway 14L/14R after the ATCT is constructed.	(See general comment under B-10)
B-11)	Geometry to Taxiway N2, U & existing Runway 18-36 should be reconfigured. Shift the new north/south taxiway east to line up with the transition to Runway 27R approach.	The new north-south Taxiway "18-36" is planned to take advantage of existing pavement. The geometry of this intersection has been slightly reconfigured. The northern

Ref. No.	Comment	Response
		end of Runway 18-36 pavement (north of Taxiway U) has been removed. An ultimate phase concept plan has been submitted with the ALP that more clearly depicts the configuration of the intersection.
B-12)	The runway OFZ's for 14L and the new Runway 9L-27R must not overlap, if simultaneous operations are anticipated.	Runway 14L-32R and Runway 9L-27R simultaneous independent operations will not be conducted. Dependent operations may exist in certain runway use configurations and will be controlled by Air Traffic.
B-13)	CAT II and CAT III on new Runway 9L-27R will require hold lines to conform to TERPS requirement of 400 feet plus in some places.	Holdline added to restrict access to 400' parallel taxiway section during CAT II/III operations
B-14)	Runway 9L-27R safety areas show what appear to be open creeks passing through the runway safety areas. Standing water is not permitted in any runway safety area. Additionally, the future Willow Higgins Creek must be tiled below ground level so it does not create a wildlife hazard.	Creeks in 9L-27R RSA are routed through culverts. Drawing changed to show headwalls and symbol added to legend.
B-15)	The following items must be removed from the Runway 9L/27R Safety Area.	
a.	A future drainage ditch transverses the RSA on both ends.	Ditches in 9L-27R RSA are routed through culverts. Drawing changed to add headwalls and symbol added to legend. Existing structures will be removed.
b.	The existing structures in the Runway 9L RSA.	Existing structures to be removed from future 9L RSA.
B-16)	The following items must be removed from the Runway 9L Object Free Area	Relocated Mount Prospect Rd has been realigned to clear 9L OFA per comment
a.	Roadway beyond the end of the runway at the northwest corner of the OFA.	Roadway cleared from OFA per comment
b.	Fence shown inside the roadway limits beyond end of runway near northwest corner of the OFA.	Fence-line adjusted per comment
B-17)	OFA for the future 9L/27R parallel taxiway appears to be incorrect	Taxiway OFA has been corrected

Ref. No.	Comment	Response
B-18)	From other documents, it appears that the existing Runway 9R pad will be removed and a tunnel will be constructed underneath three parallel taxiways before connecting with an existing airfield roadway tunnel. This development is not depicted on the future ALP.	This tunnel alternative is no longer included in the service road plan and is not depicted on the future ALP
B-19)	Future Runway 9L (Sheet 1 of 2) (Sheet #11)	Future Runway 9L Approach Sheet updated per comments
a.	Ensure the alignment of obstruction evaluation points between the plan and profile views (i.e., R5 through R9).	(See general comment under B-19)
b.	It appears that obstruction evaluation points FW1, FW2, and FW3 delineate a future waterway. If so, depict this waterway on the plan view and on the Future ALP.	(See general comment under B-19)
c.	What is the rationale behind trimming certain existing trees on future property to be acquired by the Airport (i.e., T27-T29, T34-T38, T49-T50) instead of removal? The FAA recommends removal of the trees.	(See general comment under B-19)
d.	There are at least two required obstruction evaluation points (existing roads) that are not depicted.	(See general comment under B-19)
e.	There are two sets of parallel railroad tracks crossing under the approach surface, but obstruction evaluation points are only depicted for the closer set.	(See general comment under B-19)
B-20)	Future Runway 9L (Sheet 2 of 2) (Sheet #12)	Future Runway 9L Approach Sheet updated per comment
a.	In the Plan view, the label for object B-13 is illegible because of the property line.	(See general comment under B-20)
b.	Points FW1, FW2, and FW3 are depicted on both sheets #11 and #12. See specific comment on Sheet #11 pertaining to these points.	(See general comment under B-20)
B-21)	Future Runway 27R (Sheet #13)	Future Runway 27L Approach Sheet updated per comment
a.	Depict planimetrics for the area beyond Interstate Highway I-90.	(See general comment under B-20)
b.	There are several future roads shown beyond the Runway 27R end on the Future ALP that are not depicted in the plan view. These roads should be added to the plan view and the appropriate obstruction evaluation points should be depicted.	(See general comment under B-20)

PHASE 1B- RUNWAY 10L/28R EXTENSION

Ref. No.	Comment	Response
B-22)	Runway 10L Instrumentation:	
a.	Glide Slope and PAPI. The glide slope as shown on the future ALP is incorrectly distanced from threshold, instead of the nominal 1,050 feet. Corrective action will be required to meet Glide Slope/PAPI FAA standard siting criteria. The centerline of the connector taxiway behind the shown PAPI is 1,374 feet from threshold. If the glide slope antenna mast stands 1,050 feet from runway threshold, the PAPI sited anywhere between 300' and 350' behind the glide slope will fall on the connector taxiway behind the glide slope.	Glideslope & PAPI longitudinal siting adjusted per criteria to match preliminary runway profile, and to avoid connecting taxiway. Glideslope now sited at 1,085' from runway threshold with resultant TCH of 57.0'. Connector taxiways relocated to centerline distance from runway threshold of 1,304'.
b.	The ALSF-2 light lane must cross the railroad tracks at a right angle where the tracks are set widely apart. The railroad tracks on the 10L approach are two sets of two tracks each, separated by a wide median. In that median, there is ample room to install a light bar tower. If a light bar tower is installed in the railroad median, an access road grade crossing would be necessary across the two tracks on which railroad cars would block the crossing for the shortest duration. Even with the light bar in the railroad median, a couple of light bar intervals would deviate from the standard siting criteria. This non-standard spacing requires corrective action. With the light bar in the railroad median, an ALSF-2 bridge would not be required, but a special turnoff on the east side of York Road might be necessary to access the light bar. If a light bar tower is sited between the tracks and York Road, a special turnoff on the east side of York Road would definitely be needed. Alternatively, if an ALSF-2 bridge across York Road and the tracks were constructed, the turnoff on the east side of York Road would not be necessary.	10L ALSF-2 light bar stationing adjusted per FAA comments and discussions at NAVAID working sessions. Light bar locations have been adjusted to allow localizer siting at 1,010' from runway threshold and clear the railroad alignment under standard stationing criteria. Access routes have been detailed.
c.	If the building just west of York Road remains, one or two ALSF-2 light bars would have to be mounted on the building. This light bar siting would be a structural, access, safety, and leasing problem that would have to be solved.	Off-airport access to ALSF-2 installations will be provided through avigation easement. Access details will be determined during engineering design.
B-23)	Runway 28R Instrumentation	
a.	Instead of showing the Runway 28R glide slope 330 feet off runway centerline, show the existing glide slope in its existing location as future glide slope. We plan to use the existing glide slope for the future Cat-II/III approach.	Runway 27L glideslope shown in existing location per comment

Ref. No.	Comment	Response
b.	The ALSF-2 as proposed will require 156 semi-flush lights. This is a non-standard configuration. Corrective action should be taken. The Runway 28R blast pad has been extended out to Taxiway Q and from Taxiway Q to the northwest edge of Runway 22L. In addition, the lights embedded in Runway 22L will also have to be semi-flush. A total of 156 ALSF-2 steady-burning lights will have to be semi-flush. Fifteen existing Medium Intensity Approach Lighting Systems (MALS) semi-flush lights are installed and operating under a National Change Proposal (NCP) waiver. There will also be a long non-standard space between the two light bars nearest Mannheim Road. This non-standard configuration requires correction. The approach light plane can begin to rise significantly above ground elevation only east of the thousand-foot bar east of Runway 22L.	Preliminary FAA 28R ALSF-2 light bar stationing incorporated into future ALP
c.	Based on the future configuration, the Runway 28R approach Inner Marker and Localizer Far Field Monitors would be non-standard. Corrective action is required.	28R inner marker and far field monitor antennas located per FAA comment and discussion during NAVAID working sessions. This inner marker siting is non-standard and will require a NCP waiver.
d.	Based on the future configuration, the Runway 28R Inner Marker (IM) antenna would be installed about 205 feet south of the Runway 28R centerline and 205 feet southeast of the Runway 22L centerline. This non-standard configuration will require corrective action to meet current FAA standards.	28R inner marker and far field monitor antennas located per FAA comment and discussion during NAVAID working sessions. This inner marker siting is non-standard and will require a NCP waiver.
e.	The offset from Runway 28R centerline is required to preclude penetrating the approach light plane. The Far Field Monitor (FFM) antennas will be installed west of the snow equipment road, under the approach light plane. The antenna feed cables for the FFM and IM antennas will originate in the Runway 10L Localizer/28R ALSF-2 building. The IM antenna will stand about 650 feet from the building. That should be a short enough distance to run antenna feed cable in underground conduit to the IM antenna direct from the building.	28R inner marker and far field monitor antennas located per FAA comment and discussion during NAVAID working sessions. This inner marker siting is non-standard and will require a NCP waiver.
f.	Railroad Relocation: The ALSF-2s of future Runways 9L, 9C, 9R, 10L, 10C, and 10R are all shown crossing railroad tracks. Permits for these crossings will be required from the railroad. To facilitate the issuance of permits for construction within the railroad right of way, it is essential that the DOA begin planning with the railroad now, if that planning is not already in progress.	Off-airport access to ALSF-2 installations will be provided through avigation easements. Access details will be determined during engineering design. General note added to future ALP to reflect this intent.
g.	Irving Park Road/York Road Intersection Reconstruction: Elements of the ALSF-2's of future Runways 9C, 9R, 10L, and 10C are shown west of York	Off-airport access to ALSF-2 installations will be provided through avigation

Ref. No.	Comment	Response
	Road on land that is shown off airport property. It is the DOA's responsibility to furnish all the interests in real estate required for the establishment of navigational aids. For ALSF-2, the interests include land on which to install light bar structures, cable ducts and cables, access roads and walkways, personnel ingress and egress, security, appurtenances, and avigation easements to protect the approach light planes from penetration. These avigation easements will be for airspace below the FAR Part 77 50:1 approach light plane. For the Runways 9C and 10L ALSF-2s, facility elements will have to be constructed on existing buildings off airport property. If these buildings are to remain, then the DOA must obtain special real estate interests that will be mutually acceptable to the owner of the ALSF-2 and of the buildings.	easements. Access details will be determined during engineering design. General note added to future ALP to reflect this intent.
B-24)	Runway 10L high-speed exit taxiway at the intersection with current Runway 14R/32L and Taxiway M creates a vast expanse of concrete, which is not conducive to pilot orientation and runway safety and must be redesigned. It appears that a portion of Runway 14R-32L will become taxiway when it is decommissioned, i.e., at the commissioning of Runway 10R-28L. The superfluous pavement should be demolished and removed. This configuration would still cause a complex taxiway/taxiway/runway intersection for Runway 10L-28R.	This Runway 10L high-speed exit taxiway has been relocated 800 feet further east which will reduce intersection complexity
B-25)	To protect the runway from incursions, the pad adjoining the north side of the Runway 10L approach end should be shifted north toward the terminal apron and a single, standard connecting taxiway should be provided. Consideration should be given to the length of the hold line and the placement of the signs. If two separate taxiway connectors are absolutely needed, an island should be constructed adjacent to the runway to control access to Runway 10L.	The pad adjoining the north side of the Runway 10L approach end has been removed and a single connecting crossover taxiway provided.
B-26)	The previous 9R and future 28L Pads depict pavement removal and or reconfiguration. What operational restrictions will be placed on holding aircraft in the old 9R pad and the new 28L / 22L pad?	The northern edge of the existing Runway 9R hold pad will be demolished and the northern portion of the pad will be converted to an east-west taxiway. The existing 9R Hold Pad will then be restricted from use as a hold pad. The Existing Runway 4R (Future "4R-28L") Hold Pad has been reduced in size to protect the Future Runway 10R-28L Obstacle Free Area (OFA). As a result, the "4R-28L" pad will be restricted to Airport Design Group III aircraft or smaller with wingspans up to but not including 118 feet. While holding in the pad, there is sufficient clearance to a B747-400 on

Ref. No.	Comment	Response
		Taxiway S and/or a B747-400 located on the southern entrance taxiway to Runway 28L. Additionally, there is sufficient clearance for a B747-400 aircraft to taxi on Taxiway S while another B747-400 is holding on the entrance taxiway to Runway 28L (hold line located 300 feet south of the Runway 28L centerline).
B-27)	Provide valid justification for the removal of pavement in the future 28L / 22L pads and to create islands. The pavement was originally paid for by AIP funds and a justification on why the islands are being created and why the current pavement is no longer valuable to the airport's operation is required for removal. If the pavement is removed, the future ALP should depict pavement removal in this location.	The addition of a new future east-west taxiway between parallel Taxiways M and D will be used to feed Runway 22L departures. As a result, this taxiway traverses through the existing hold pad resulting in the need to provide the islands to clearly delineate the taxiway from the new "28R-22L" Hold Pad. The Existing Runway 4R (Future "4R-28L") Hold Pad has been reduced in size to protect the Future Runway 10R-28L Obstacle Free Area (OFA).
B-28)	Runway 10L/28R Length In the phasing program presented in the Project Definition Report, Phase 1C, an operational assumption is that a maximum runway length of 13,000' is available on Runway 14R/32L until construction progresses to the point of impacting the runway. At that point, a maximum runway length of 13,000' will be available on Runway 10L/28R (assuming completion of the facilitating railroad relocation). Runway 10L will have an LDA and ASDA of 12,249', not 13,000'. TORA and TODA for 10L, as well as all declared distances for 28R, will be 13,000'.	Existing RW 9R-27L (Future RW 10L-28R) will be extended to 13,000 feet. Future RW 10L will have an LDA and ASDA of 12,246 feet, TORA TODA of 13,000 feet. During construction of RW 10C-28C, the 32L threshold will be relocated with RW 14R-32L having a new runway length of 8,165 feet. Detailed phasing plans will be developed by the City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts.
B-29)	See "General Technical Comments #A-46" section of this document on runway/taxiway separation for Runway 10L/28R.	See response to Comment A-48
B-30)	Explore other options for snow removal equipment staging and consider eliminating the	Snow removal equipment staging on airfield

Ref. No.	Comment	Response
	East/West Snow Road. The runway-taxiway separation between future Runway10L-28R and parallel Taxiway M is apparently being reduced from 500 to 400 feet at the east end to accommodate the snow road transition to the north side of Taxiway B. This would seem to sacrifice a long-term benefit for a short-term gain, since it may preclude CAT II/III operations on 10L-28R. Request this be reevaluated. In addition this would clean up the geometry in this location.	surfaces such as the Runway 28C hold pad is viable. However, the service road is needed to alleviate service vehicle traffic congestion from the Terminal 5 and 6 ramp areas. Runway 10C-28C will be the primary CAT II/III runway when commissioned. Runway 10L-28R would then be the primary CAT II/III departure runway when Runway 10C-28C is commissioned. ADG-V aircraft may be restricted from using Taxiway M during 10L-28R CAT II/III arrivals (400' TW-to-RW centerline separation). A collision risk assessment would be required. See Appendix C for additional details.
B-31)	Remove the existing Union Pacific railroad track from the Runway 10L Safety Area.	Existing railroad to be relocated. Existing track will be removed as required for airfield development.
B-32)	Depict future land acquisition for ALS "light lanes" that extend off of the future airport property (i.e., 9C, 9R, 10L, 10C)	Off-airport access to ALSF-2 installations will be provided through avigation easements. Access details will be determined during engineering design.
B-33)	Depict taxiway to taxiway separation distance for Taxiways "A" and "B" in the vicinity of the existing core terminal	Taxiway centerline separations shown per comment
B-34)	Depict Taxiway "A" OFA in the vicinity of the existing core terminal	Taxiway A OFA added per comment
B-35)	Restrict Taxiway Q and/or controlled during departure operations on Runway 10L and 28R and during arrival operations on 28R.	Existing RW 27L (Future RW 28R) Clear Zone will remain in effect to restrict aircraft during certain operations. See Appendix A
B-36)	Future Runway 10L (Sheet # 18)	Future Runway 10L Approach Sheet updated per comment
a.	Depict obstruction evaluation points for terrain that penetrates the approach surface.	(See general comment under B-36)
b.	The relocated railroad is not depicted in the plan view. The appropriate obstruction evaluation points should be added.	(See general comment under B-36)

Ref. No.	Comment	Response
c.	Consider changing existing railroad resolutions from "N/A" to "relocated".	(See general comment under B-36)
d.	Object Number R16 is not depicted in either the Plan or Profile View.	(See general comment under B-36)
e.	There are at least six other required obstruction evaluation points (existing roads) that are not depicted.	(See general comment under B-36)
B-37)	Existing Runway 27L/Future Runway 28R (Sheet # 19)	Future Runway 28R Approach Sheet updated per comment. No planimetrics available for area east of I-90 along extended runway centerline. Consistent with AC 150/5300-13, the approach surface drawings depict at least the area through which the Part 77 approach surface reaches 100 feet above the runway end (in this case 5,200 feet horizontally from the runway end.)
a.	Remove Runway 22L elevation.	(See general comment under B-37)
b.	Depict plan metrics for the area beyond Interstate Highway I-90.	(See general comment under B-37)

PHASE 1C- RUNWAY 10C/28C

Ref. No.	Comment	Response
B-38)	Runway 10C Instrumentation	
a.	Glide Slope and PAPI. The Glide slope is shown only 850 feet from threshold, instead of the nominal 1,050 feet. Corrective action will be required to meet Glide slope/PAPI FAA standard siting criteria. The centerline of the connector taxiway behind the shown PAPI is 1,374 feet from threshold. If the glide slope antenna mast stands 1,050 feet from runway threshold, the PAPI sited anywhere between 300' and 350' behind the glide slope will fall right on the pavement of the connector taxiway behind the glide slope.	10C Glideslope & PAPI longitudinal siting adjusted per criteria to preliminary runway profile and to avoid connecting taxiway. Glideslope now sited at 1,085' from runway threshold, with resultant TCH of 54.3'.
b.	ALSF-2. The ALSF-2 light lane must cross the railroad tracks at a right angle where the tracks are set widely apart.	10C ALSF-2 light bar stationing adjusted per FAA comments and discussions at NAVAID working sessions. Light bar locations have been adjusted to allow localizer siting at 1,010' from runway threshold, and clear the railroad alignment under standard stationing criteria. Access routes have been detailed.
i)	The railroad tracks on the 9R approach are two sets of two tracks each, separated by a wide median. In that median, there is ample room to install a light bar tower. If a light bar tower is installed in the railroad median, an access road grade crossing would be necessary across the two tracks on which railroad cars would block the crossing for the shortest duration. Even with the light bar in the railroad median, a couple of light bar intervals would deviate from the standard siting criteria. With the light bar in the railroad median, an ALSF-2 bridge would not be required, but a special turnoff on the east side of York Road might be necessary to access the light bar. If a light bar tower is sited between the tracks and York Road, a special turnoff on the east side of York Road would definitely be needed. Alternatively, if an ALSF-2 bridge across York Road and the tracks were constructed, the turnoff on the east side of York Road would not be necessary.	(See general comment under B-38b.)
ii)	On the Runway 9R approach, there is no building (at present) at the light bar sites west of York Road.	(See general comment under B-38b.)
B-39)	Runway 28C Instrumentation	The runway 28C threshold has been repositioned to end of pavement such that a displaced or relocated threshold is not required. Additionally, per Option LA-2,

Ref. No.	Comment	Response
		detailed in Comment B-39(b)(iv)(b), and discussion during working sessions, the Runway 10C localizer has been repositioned east of 4R-22L to 2,570' from threshold.
a.	The Runway 10C Localizer antenna array is shown on the future ALP at 1,000 feet from the marked 28C threshold. With this siting, the southeast corner of the localizer critical area touches the northwest edge of Taxiway "S". The 10C array cannot move any farther east, because if it did, Taxiway "S" would encroach upon the critical area. Therefore, to center the Runway 10C array 1,010 feet from the Runway 28C marked end, the marked end must move 10 feet west of its present location. Moving the runway end 10 feet west:	(See general comment under B-39)
i)	Makes 10,590 feet available for Runway 10C departures and Runway 28C landings.	(See general comment under B-39)
ii)	Results in a 210-foot pavement length between pavement end and marked threshold, rather than the presently shown 200-foot space.	(See general comment under B-39)
iii)	Causes the inner edge of the approach surface to lie 10 feet west of the runway pavement end. In option LA-1 below, a 230-foot pavement length between the end of the pavement and the threshold is considered.	(See general comment under B-39)
b.	Runway 28C ALSF-2 and Inner Marker and Runway 10C Localizer:	Low approach light plane profile and semi-flush lights will be required. Provisional light bar stationing depicted on ALP to be refined during engineering design. Inner marker siting will be non-standard and may require a NCP waiver. Currently shown as 205' offset from centerline. See general comment under B-39 for localizer resolution.
i)	The FAA anticipates that semi-flush steady-burning and flashing lights will be installed at nominal stations 13+00, 14+00, 16+00, 21+00, and 22+00.	(See general comment under B-39b)
ii)	The approach light plane must have a very low profile. In crossing Runway 4R-22L and Taxiways "S" and "S4", the ALSF-2 approach light plane will have to stay very close to runway and taxiway existing grade.	(See general comment under B-39b)
iii)	The Runway 10C Localizer array location as proposed is a high object, and is prohibited from penetrating the low-profile Runway 28C ALSF-2 approach light plane.	(See general comment under B-39b)

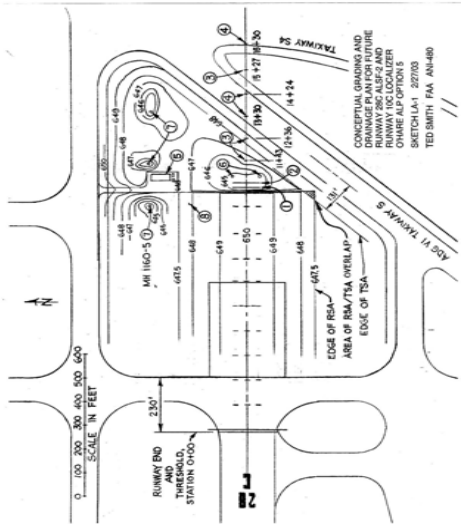
Ref. No.	Comment	Response
iv)	The array is 6.8 feet high from the top of the foundation (at finished grade) to the top of the radome. With customary infield grading, the array would penetrate the level approach light plane of a low-profile ALSF-2. FAA Order 6850.2a, Visual Guidance Lighting Systems prohibits any penetration of the approach light plane on CAT-II or CAT-III approaches. The antenna array will be at least a 14-Element Log Periodic Dipole Array. While such arrays do behave as frangible objects when struck, there would nevertheless be considerable mass protruding above the approach light plane. Corrective action will be required to meet FAA standards. In view of the above, the following two design options should be considered:	(See general comment under B-39b)
(a)	Option LA-1: This option requires coordination among: • The designer of the runway and RSA • FAA Airports • FAA Flight Standards • FAA Airway Facilities ANI NAVAIDs designer • FAA Airway Facilities maintenance This option requires the following features shown on Sketch LA-1 and defined in the numbered legend: • Marking the Runway 28C threshold (end) 230 feet from the runway pavement end instead of the 200 feet as shown on the future ALP. • RSA grading with a runway extended centerline elevation of exactly 650.0 from runway pavement end to 970 feet east of runway pavement end (1,000 feet from runway end, at station 10+00). • A 4H: 1V finished grade slope from elevation 650.0 on runway centerline at station 10+00 down to 645.0 at station 10+20. • On runway centerline, a 1.0 percent downslope from 645.0 at station 10+20 to 644.6 at station 10+60, and a rising slope from station 10+60 to Taxiway "S". • Watersheds and storm drain inlets. • Localizer antenna, ALSF-2 light bars and flashers, Localizer/ALSF-2 building, and inner marker. Moving the runway end 230 feet west of pavement end:	

Ref. No.	Comment	Response
	• Makes 10,570 feet available for Runway 10C departures and Runway 28C landings. • Results in a 230-foot taxiway length between pavement end and marked threshold, rather than the presently shown 200-foot space. • Causes the inner edge of the approach surface to lie 30 feet west of the runway pavement end. *For the remainder of the discussion of this option, station numbering will be based on the 230-foot threshold as origin (0+00).* If the runway end is just 230 feet west of pavement end, there will be a small RSA/TSA overlap, as shown on Sketch LA-1 (See comment #B-48). It is hoped that this overlap will not require grade changes that affect NAVAID design. The Localizer infield grading, drainage, and storm sewerage must be designed such that the Localizer antenna array foundation top elevation is 645.0, for a radome top elevation of 651.8 above mean sea level. This elevation setting gives the best compromise between localizer function and low ALSF-2 profile. The lowest elements of the localizer antenna will be at elevation 651, or one foot above the RSA maximum elevation of 650. A localizer antenna array installed any lower would run the risk of signal blockage by the ground. There must be line of sight from the localizer antenna elements to all points on the runway. Therefore, the runway must slope continuously upward from the 28C end to the 10C end. The localizer array radome top will be at elevation 651.8. The lamp centerline elevation of the thousand-foot bar will be 652.0, just high enough to make the ALSF-2 approach light plane clear over the localizer array without penetration. If the pavement configuration on the approach to Runway 28C does not change, the ALSF-2 threshold light bar (station 0+10), and the next two light bars east (1+14 and 2+18), must be semi-flush. The next light bar east (3+22) will be frangible, and the lamp centerline elevation will be 651.2. Between the 3+22 bar and the 10+50 bar, the positive slope in the approach light plane will be 0.11 percent, extremely shallow. In that 728-foot-long segment, the plane would rise only 0.8-foot. The problem will be the negative slope between the 10+30 light bar and the semi-flush light bar at approximately station 13+10, embedded in Taxiway "S". With the 10+50 light bar lamp centerline elevation 652.0, and the 13+30 semi-flush light fixture elevation 649.0 (estimated), the negative slope of this four-station segment will be 1.11 percent. For maintenance reasons, we desire to site the semi-flush light bars as close to taxiway and runway edges as feasible. So sited, they will incur minimal damage from airplane wheel loads. For this reason, we	

Ref. No.	Comment	Response
	recommend against placing the semi-flush bar at station 13+50. FAA Order 6850.2A criteria prohibit: • More than one sloping segments in an ALSF-2. • A negative slope steeper than 1.0 percent. • A negative slope in an ALSF-2 beginning less than 1,500 feet from threshold The light plane segment between stations 10+50 and 13+30 would deviate from these three criteria, but differ *significantly* only from the third. Corrective action will be required to meet FAA Standards. The unusual infield grading proposed in Sketch LA-1 is designed to preclude penetration of the approach light plane by the localizer antenna array. The design was developed because: • Siting the localizer east of Runway 22L will give create a significant ground control problem. • <u>The Localizer as sited in option LA-1 has a 75-percent probability of performing to Cat-II/III tolerances.</u> If the localizer fails to perform to Cat-II/III standards, then it will be necessary to re-establish the localizer east of Runway 22L per Paragraph (b) below, with the attendant ground control problem. The risk of failure is low but significant. The approach light plane will necessarily be choppy in elevation as it alternates between semi-flush and frangible mounts. The semi-flush lights will range 1 to 1.5 feet lower than the adjacent frangible lights. Corrective action will be required to meet FAA Standards. At four locations, frangible flasher ICCs will penetrate the approach light plane by about two feet. These penetrations are unacceptable and will require corrective action to meet current FAA standards. The frangible lights near the taxiway and runway edges will have to be as low as feasible, to ensure that they will not be struck by any portion of any airplane, regardless of the airplane's position on the runway. The flasher ICCs will have to be remote from those lights for the same reason. Previous research has revealed that the outboard nacelles of some four-engine jets are low enough to be of concern for low objects mounted a considerable distance from runway and taxiway edge. Because of cable length limits, some ICCs will have to stand within taxiway or runway safety areas, some in OFAs. We anticipate that it will be necessary to cluster three ICCs near station 15+27, on the slightly depressed grade of the infield between stations 14+24 and 16+30. The three ICCs near station 15+27 will be those for the sequenced flashers at stations 14+24, 15+27, and 16+30.	

Ref. No.	Comment	Response
	Similarly, there will have to be a cluster of: • Two ICCs near station 18+30, serving flashers at 17+30 and 18+30. • Three ICCs near station 19+30, serving flashers at 19+30, 20+30, and 21+30. • Three ICCs near station 24+30, serving flashers at 22+30, 23+30, and 24+30. These ICCs will have to penetrate the approach light plane, but will not break line of sight. If the Runway 28C ALSF-2 is to be established and operated with Cat-II/III visibility credit, a two-foot penetration of an approach light plane will require corrective action to meet current FAA standards.	
(b)	Option LA-2. Design the 10C Localizer array 2,650 to 2,700 feet from the Runway 28C threshold. In this design, the 10C localizer critical area would overlie Runway 4R-22L and Taxiways "S" and "S4". Runway 22L would be a routine taxi route to departure Runway 10R in Exhibit V-35 (Taxiway Routes, Option 5 - IFR East Flow) of the Airside Simulation Analysis. This Localizer siting would give Air Traffic a significant ground control problem, since the Runway 22L taxi route would run right through the localizer critical area of Runway 10C, the primary IFR arrival runway.	
v)	For a 10C localizer array installed west of Runway 4R-22L, the localizer building will stand to the northeast of the array. The building will be outside the RSA and the OFA. This building would be in danger of being jet-blasted by an airplane turning from westbound on Taxiway "L" to northbound on the nearby connector to Runway 28R (existing 27L). Consideration should be given to constructing this building of concrete block, for maximum strength.	(See general comment under B-39b)
vi)	The inner marker (IM) will probably be sited about 960 feet from the Runway 28C threshold.	(See general comment under B-39b)
1)	If design option LA-1 above is selected:	
(a)	The Runway 28C IM antenna might be able to be installed short enough to clear under the approach light plane. If this is not possible, corrective action will be required to meet current FAA standards.	
(b)	The IM antenna feed cable routing will be standard, and no problem.	
2)	If design option LA-2 above were selected, the IM would be about 2,000 feet from the Localizer shelter. The solution to this remoteness would possibly be a freestanding weatherproof box housing the inner marker equipment, mounted 205 to 210 feet from runway	

Ref. No.	Comment	Response
	extended centerline.	
vii)	Because the Runway 28C approach light plane is so low, the Runway 28C localizer FFM antennas will have to be installed east of the approach light plane. FFM antennas must be sited on runway extended centerline. If design option LA-1 above is selected, the FFM equipment will have to be housed either in a freestanding weatherproof box near the FFM antennas, or in the existing Runway 22L glide slope building 450 to 500 feet away from the FFM antennas.	28C localizer FFM antennas provisionally sited 2,640' and 2,700' from 28C threshold per discussions at NAVAID working sessions.
viii)	The Runway 28C glide slope is shown 1,050 feet from threshold, which is acceptable.	28C glideslope, PAPI location and connecting taxiway location adjusted on future airport layout plan to ensure all required clearances achieved. Glideslope located at 1,115' from runway threshold with a resultant TCH of 58.9'. This siting will be subject to further evaluation during engineering design.
1)	The Runway 28C PAPI is shown 300 feet behind the glide slope antenna mast, which is correct.	
2)	The connector taxiway that runs just behind the glide slope may be incompatible with the glide slope and PAPI. The taxiway connector centerline is only 124 feet west of the glide slope antenna. The wingtip of an Airplane Design Group (ADG) VI airplane on that connector could strike the glide slope shelter. In addition, an airplane turning off the connector could cause jet blast to the shelter. Move the connector west 300 feet, to make it clear the PAPI, which will then stand on the east side of the connector. The PAPI cannot be moved to the other side of the runway, as it would land on the high-speed turnoff taxiway. In its new location, the connector's east edge will be about 370 feet from the glide slope building, which is an acceptable distance.	

Ref. No.	Comment		Response
		NUMBERED LEGEND FOR SKETCH LA-1 1 RUNWAY 10C LOCALIZER ANTENNA ARRAY CENTERED AT STATION 10+30, RADOME TOP EL 651.8. 2 RUNWAY 28C THOUSAND-FOOT LIGHT BAR AND FLASHER, STATION 10+50, LAMP C/L EL 652.0. 3 FRANGIBLE ALSF-2 LIGHT BAR AND FLASHER. AT STATION 11+43, LAMP C/L EL IS 651.0. AT STATION 12+36, LAMP C/L EL IS 650.0. 4 SEMI-FLUSH ALSF-2 LIGHT BAR AND FLASHER. AT STATION 13+30, LAMP C/L EL IS 649.0. 5 RUNWAY 10C LOCALIZER/28C ALSF-2 BUILDING. 6 NEW STORM DRAIN INLET. EXISTING STORM DRAIN INLET. RUNWAY 28C INNER MARKER ANTENNA.	
B-40)	The proposal to have high-speed exit taxiways from the north side of the new Runway 10C-28C where existing Taxiway K and existing Runway 14R-32L cross the new runway creates complex intersections that could contribute to pilot disorientation thus should be avoided.		The Runway 10C high-speed exit taxiway located approximately 6,000 feet from the Runway 10C approach end has been strategically placed to minimize runway occupancy time. The City of Chicago's O'Hare Modernization Program Office is reviewing a phasing plan to permanently relocate the Runway 32L threshold north of Taxiway M beginning with the construction of Runway 10C-28C. This would preclude the Runway 10C high-speed exit from crossing Runway 32L.

Ref. No.	Comment	Response
B-41)	Delete the two, joined, high-speed exit taxiways on the north side of Runway 10C-28C, west of Taxiway K, and East of Taxiway L1 that creates a wide expanse of pavement (excess of 600 feet wide) that could be confusing for pilots as part of an overall reduction of high-speed exit taxiways on the north side. If the joined, high-speeds are absolutely needed at that location, an island should be inserted clearly defining two, separate, high-speed exit taxiways and taxiing aircraft on Taxiway L.	An island has been provided at this intersection to more clearly define two separate high-speed exit taxiways and the parallel Taxiway L
B-42)	The second connecting taxiway, perpendicular to the runway, just east of the west end of Runway 10C-28C, should be eliminated to reduce pilot confusion potential, unless absolutely needed.	The second connecting north-south crossover taxiway originally shown 324' east of the west end taxiway perpendicular to Runways 10L and 10C, has been relocated east of the Runway 10L and 10C glideslope critical areas.
B-43)	Sheet 3 of the 38-sheet ALP set, "Future Airport Layout Plan", shows a different taxiway layout north of the Runway 10L extension and parallel taxiway than Exhibit 31, "Implementation Phase 1C", in the Project Definition Report. Which is correct?	Connecting taxiway layout north of future runway 10L has been reconfigured on the Future ALP, and will match in all future documentation.
B-44)	Tunnel from South Cargo to terminal core is not fully color coded in accordance with legend.	Tunnel correctly color coded per comment
B-45)	Ensure headwall to south service road tunnel is outside Runway 10C/28C RSA.	Headwall located outside RSA per comment
B-46)	The depicted service road system in the vicinity of the expanded M5 & Bravo Taxiways and K Concourse must be tunneled. It would be impossible to ensure safe vehicle transition in this location based on the magnitude of traffic and the increased distance, with the vast expanse of taxiway pavement that a vehicle must give way to aircraft while on the service road.	Existing service roads in the vicinity of Taxiways 'M5', 'B' and K Concourse have been rerouted to avoid taxiway intersection in the area. East-west traffic will use the rerouted tank farm road extension south of taxiway 'B'.
B-47)	The taxiway safety area and the runway safety areas must not overlap on Runway 28C and Taxiway S. A review of Group 6 aircraft utilizing S Taxiway behind Runway 28C will need to be performed. This will also require evaluation of the threshold for Runway 28C.	Future Runway 10C LDA of 10,540' will provide at least 1,000' of clearance for arriving aircraft when aircraft with wingspans up to but not including 262' (ADG-VI) are taxiing on Taxiway S; Hold markings will be established on Taxiway S to protect for departures on Runway 10C or landings on Runway 28C.

Ref. No.	Comment	Response
B-48)	The Future Bensenville Ditch should be placed in a culvert to prevent a potential wildlife hazard.	Bensenville ditch placed in culvert through light plane per comment
B-49)	Verify that the base map buildings depicted in the 10C RPZ and the flight Kitchen located in the 28C RPZ are not public places of assembly. If these buildings are considered places of public assembly, remove the facilities. This verification includes the type of facilities and the number of people gathered at peak times and the amount of time considered peak time (AC 150/5300-13).	Building 504 - Gate Gourmet Flight Kitchen planned future use is primarily cold storage and warehousing. There will be approximately 20-25 employees dispersed throughout the entire building and there will be no public assembly use
B-50)	Airport Data Sheet (Sheet #4)	
a.	Runway 28C threshold is displaced on the future ALP but no threshold displacement is indicated in the Airport Data Sheet (Displaced Threshold = "none" in Airport Data Sheet)	Future Runway 28C displaced threshold removed. Threshold moved to edge of runway pavement
b.	No Runway Threshold Elevation is depicted for the Runway 28C displaced threshold	Threshold elevation shown on future airport layout plan
c.	Future Runway 10C/28C PAPI's depicted on the future ALP are not included in the Airport Data Sheet	PAPIs added to airport data sheet per comment
d.	Runway length for 10C/28C should be 10,800'.	Future runway 10C-28C length of 10,800' updated on airport data sheet
B-51)	Future Runway 10C (Sheet # 20)	Future Runway 10C Approach Sheet updated per comments
a.	Depict obstruction evaluation points for terrain that penetrates the approach surface.	(See general comment under B-51)
b.	The relocated railroad is not depicted in the plan view. The appropriate obstruction evaluation points should be added.	(See general comment under B-51)
c.	There are at least five required obstruction evaluation points (existing roads) that are not depicted.	(See general comment under B-51)
B-52)	Future Runway 28C (Sheet # 21)	Future Runway 10C Approach Sheet updated per comments
a.	There are two approach surfaces shown on the plan view. The correct approach surface should be depicted as beginning 200 feet beyond the physical end of the runway, not 200 feet beyond the displaced threshold.	(See general comment under B-52)

Ref. No.	Comment	Response
b.	Remove the label in the profile view that states "Spine Road Centerline at Extended Runway Centerline". If necessary, depict an obstruction evaluation point as required at this location.	(See general comment under B-52)
c.	Why is Runway 4R/22L shaded?	(See general comment under B-52)
d.	There are at least two required obstruction evaluation points (existing road) that are not depicted.	(See general comment under B-52)
B-53)	Future Airport Layout Plan Part 77 Surfaces Drawing (Sheet #35)	Future Runway 28C displaced threshold removed. Threshold moved to edge of runway pavement.
a.	Verify Runway 28C end elevation (is 650' the displaced threshold or end?)	(See general comment under B-53)
b.	Verify Runway 28C approach surface origination point, which should begin 200' from the end of the runway, not the displaced threshold (primary surface appears to be approximately 11,000' long)	(See general comment under B-53)

PHASE 1 WEST SATELLITE CONCOURSE

Ref. No.	Comment	Response
B-54)	RTR ORD is presently located in the area identified as the future location of the West Terminal Satellite Concourse (T4) and will require relocation. FAA requests additional information on the future concourse building. This will be used for evaluation of its potential as a home for a replacement co-located communication site.	The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA to ensure site requirements are fulfilled. Additional detailed information on the West Terminal will be provided when it becomes available during engineering design.
B-55)	The existing FAA Special Purpose Building and the HAZMAT Building will require relocation.	Special purpose building and hazmat facility relocated to SPA-P
B-56)	The taxiway off the north side of the apron should intersect existing Runway 14R-32L perpendicularly. Is this a temporary configuration? It is not clear on the "Future Airport Layout Plan".	The taxiways located at the northeast corner of the West Terminal are not planned for construction until Runway 14R-32L is relocated and decommissioned as a runway. Subsequent to Runway 14R-32L conversion to a taxiway, the taxiways located at the northeast corner of the West Terminal would then be built. Furthermore, to eliminate a potential complex intersection, two taxiway connectors located north of the 14R-32L taxiway (T3, T4, T5) have been removed from the ALP.
B-57)	Unless the existing terminal core roadway is tunneled, a roadway system must be added to connect South Cargo and the Post Office to the West Terminal. It appears that the current configuration of roadways will force traffic from the south cargo / post office into the terminal core roadways in order to access the West Terminal. This would create an unacceptable amount of additional traffic, which would cross active taxiways.	A west perimeter service road has been added to the ALP that connects the Southwest Cargo Area to the West Terminal. This will help alleviate traffic congestion through the cargo tunnel.
B-58)	The service roads on the West Satellite Terminal Apron show the TOFA as 160'. The terminal is used be Group VI aircraft and the TOFA is 193' in accordance with AC 150/5300-13, Airport Design.	The east-west service roads located at the north and south of the terminal apron areas have been moved to 193' from the taxiway per comment
B-59)	Airport Surveillance Radar (ASR):	

Ref. No.	Comment	Response
	The existing ASR shall be relocated and operational at the new location prior construction activity and earthwork for Phase 1-West Satellite and Phase 2- West Terminal.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency.

PHASE 2 WORLD GATEWAY

Ref. No.	Comment	Response
B-60)	Further describe what sections of World Gateway Program will be included in OMP and those that are not to be included.	The ALP includes projects from the OMP, WGP, and CIP. However, the ALP does not attempt to designate or associate individual projects with these specific programs.
B-61)	K Concourse extension goes through the terminal core service road system. This service road must be properly relocated.	Service road relocated per comment
B-62)	K Concourse extension appears to violate the 131' TOFA for Alpha Taxiway.	Concourse K extension requires relocation of service road. Taxiway A has been relocated to provide 160' TW centerline-to-relocated service road TOFA clearance for aircraft with wingspans up to but not including 214'(ADG-V).
B-63)	ARFF Station 3 access/egress appears to be compromised by Terminal 4 development.	Guard Post GP10 has been relocated to create sufficient space for ARFF movement
B-64)	Clarify the location of the Federal Inspection Services (FIS) locations in reference to the demand for such a facility and the phasing of the OMP. Page 26 Paragraph 4.1 of the Project Definition Report discusses wide body jets are no longer part of the redevelopment of Terminal 2, but does not discuss where those wide body jets will be included in the OMP development. In a recent meeting it was discussed Federal Inspection Services (FIS) will remain in Terminal 2, would this not necessitate some wide body jets would remain in terminal 2? In addition the Project Definition Report shows NLA, which are assumed used for international flights, in the West and West Satellite Terminals, but the Project Definition Report only discusses an FIS station in the West Terminal, which is shown to be built after the West Satellite Terminal.	It is currently envisioned that the FIS facilities will ultimately be provided in Terminal 5 (including the expanded T5/T6 facilities planned as part of the World Gateway Program), Terminal 4, and the West Terminal Complex (serving both the satellite concourse and the terminal facility). Based on future construction phasing planning to be performed in support of the implementation of these programs, and ultimately based on market conditions of the airline industry, it may be determined that temporary FIS facilities are necessary; all future planning efforts will be coordinated with the FAA.

Ref. No.	Comment	Response
B-65)	Will NLA still be able to go to terminals 2, 4, and 5, especially if the airlines located in these terminals will be using NLA? Page 26 Paragraph 4.2 of the Project Definition Report states, "the East Terminal Area will be developed consistent with the WGP." This does not take into consideration the shifting of the NLA from the WGP to the West Terminal development. In addition WGP stated Terminal 2, 4 and 5 would be capable of NLA.	Crossover ADG-VI taxiways from Runway 10C-28C parallel taxiway (ADG VI) are provided for access to gates located at Terminal 5 and 6, as well as the existing core area to support future parking of these aircraft in these areas if ever developed.
B-66)	Why does the proposed Taxiway B and M extensions (east of M5 and adjacent to Runway 28R end) need to be designed for ADG VI, when exhibit 9 (page 17) in the PDR does not indicate that ADG VI aircraft will use this parallel taxiway system to access Terminal 5/6 (East Terminal).	Taxiway B & M extensions will be designed for aircraft with wingspans up to but not including 214' (ADG-V). As such, these taxiways will not be designated for ADG VI use.
B-67)	Is there proposed future use of the East Terminal by NLA that is not described in the Project Definition Report? Both the Concept Development/Refinement Report and Exhibit 9 in the Project Definition Report indicate a need for Group VI aircraft to have access to the East Terminal area. However, the East Terminal Plan exhibit in the PDR (Exhibit 18) does not depict any A380/NLA capable gates at the East Terminal. The only A380/NLA capable gates depicted on the Composite Terminal Plan (Exhibit 16) are at the West Terminal. It is also assumed that the southwest cargo area will accommodate A380 aircraft (i.e., FedEx).	Aircraft parking plans depicted in Exhibits 16 and 18 reflect one of a number of alternate layouts and does not assume the maximum gate capability. Retaining Terminal 5 as an international terminal assumes the potential need for future NLA capable gates in Terminal 5 and potentially Terminal 6. Taxiway access to the southwest cargo area is designed to ADG VI standards.

PHASE 2A - RUNWAY 9R/27L EXTENSION

Ref. No.	Comment	Response
B-68)	Runway 9R Instrumentation	
a.	Glide Slope and PAPI. The glide slope distance from threshold is incorrect, instead of the nominal 1,050 feet. Corrective action will be required to meet glide slope/PAPI FAA standard siting criteria.	9R Glideslope & PAPI longitudinal siting adjusted per criteria to preliminary runway profile, and to avoid connecting taxiway. Glideslope now sited at 1,155' from runway threshold with resultant TCH of 57.3'.
b.	The ALSF-2 light lane must cross the railroad tracks at a right angle where the tracks are set widely apart. The railroad tracks on the approach to runway 9R are two sets of two tracks each, separated by a wide median. In that median, there is ample room to install a light bar tower. If a light bar tower is installed in the railroad median, an access road grade crossing would be necessary across the two tracks on which railroad cars would block the crossing for the shortest duration. Even with the light bar in the railroad median, a couple of light bar intervals would deviate from the standard siting criteria. With the light bar in the railroad median, an ALSF-2 bridge would not be required, but a special turnoff on the east side of York Road might be necessary to access the light bar. If a light bar tower is sited between the tracks and York Road, a special turnoff on the east side of York Road would definitely be needed. Alternatively, if an ALSF-2 bridge across York Road and the tracks were constructed, the turnoff on the east side of York Road would not be necessary.	9R ALSF-2 light bar stationing adjusted per FAA comments and discussions at NAVAID working sessions. Light bar locations have been adjusted to allow localizer siting at 1,010' from the runway threshold and clear the railroad alignment and York Rd. under standard stationing criteria. Access routes have been detailed.
B-69)	Runway 27L Instrumentation	27L Glideslope & PAPI re-sited from existing, per criteria and discussion at NAVAID working sessions. Glideslope now sited at 1,085' from the runway threshold with resultant TCH of 57.9'. PAPI sited 350' behind glideslope.
a.	Runway 27L Glide Slope and PAPI. The glide slope is not at the nominal 1,050 feet. Corrective action will be required to meet Glide slope/PAPI FAA standard siting criteria.	(See general comment under B-69)
b.	Instead of showing the glide slope 750 feet from Runway 27L landing threshold, show the glide slope 1,070 feet from threshold. As shown, the Glide slope is 1,050 feet from the runway pavement end; this is not the landing threshold.	(See general comment under B-69)
c.	Show the PAPI 1,420 feet from threshold, which will be 350 feet west of the glide slope antenna mast. This will give the PAPI ample room to clear the connector taxiway.	(See general comment under B-69)

Ref. No.	Comment	Response
d.	Runway 27L ALSF-2. The threshold light bar and nominal stations 1+00 and 2+00 light bars must be semi-flush. The ALSF-2 will extend into the car rental area east of Bessie Coleman Drive.	27L ALSF-2 light bar stationing adjusted per discussions at NAVAID working sessions to allow localizer siting at 1,010' from runway threshold and to clear Mannheim Rd. Access routes have been detailed.
B-70)	Operational Assumptions The ALP has an incorrect operational assumption- "The future GS-RVR Building will be temporarily relocated to enable the use of Runway 14R-32L." The future GS-RVR Building referred to must be the Runway 9R GS-RVR building. The 9R Glide slope has to be installed with the antenna mast 1,050 feet from 9R threshold and 400 feet from 9R centerline. So sited, the antenna mast will be only about 15 feet from the edge of the Runway 14R southwest shoulder. The 9R Glide slope building will be on the shoulder. The touchdown RVR will be on the Runway 14R pavement. A portion of 14R shoulder and runway pavement will have to be demolished in order to construct the 9R Glide slope and RVR.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency. The future 9R glideslope conflict with 14R-32L will be resolved through this process. (See general comment under B-70)
B-71)	The extension of Runway 27L/9R will create some complex configurations due to multiple runway and taxiway intersections creating large expanses of pavement, albeit on a temporary basis, at intersections with existing Runway 14R-32L, which is not planned to be demolished until Phase 2C is completed (commissioning of Runway 10R-28L).	The City of Chicago's O'Hare Modernization Program Office will assess complex intersections that may exist at each interim phase of construction including Phase 2A where new intersections will be created by the extension of Runway 9R-27L.

Ref. No.	Comment	Response
B-72)	The future high-speed exit taxiway for Runway 9R arrivals north of the Terminal One Satellite appears to overlap the one for Runway 27L arrivals, creating a very large expanse of pavement that must be resolved. Could it be shifted to the east? If so, could the second future high-speed exit taxiway at former Runway 18-36 remain a simple perpendicular connector?	The amount of pavement created by the Runway 9R high-speed exit taxiway located north of Terminal 1 will be reduced by the elimination and pavement removal of Taxiway H1. Additionally, an island has been provided between the Runway 9R and 27L high-speed exits to further reduce any expanse in pavement. The optimum location for the Runway 9R high-speed exit taxiway is less than 6,700 feet, however, due to high traffic located west of this location, 6,700 feet was considered the furthest west that the high-speed exit should be placed. The alternative, moving the high-speed exit further east of this location, has a negative effect on runway occupancy time. Elimination of this high-speed taxiway exit altogether would result in only one high-speed exit provided for Runway 9R located at 8,200 feet from the Runway 9R threshold further increasing runway occupancy time.
B-73)	To protect the runway from incursions, the large pad adjoining the south side of the Runway 9R end should be shifted south toward the terminal apron and a single, standard connecting taxiway should be provided. Consideration should be given to the length of the hold line and the placement of the signs. If two separate taxiway connectors are absolutely needed, an island should be constructed adjacent to the runway, to control access to Runway 9R.	The two taxiway connectors are considered essential for aircraft operations. This was determined through input from the FAA Air Traffic Division and through computer simulations. The pad adjoining the south side of the Runway 9R approach end has been removed.
B-74)	Remove old Runway 9L pad at Taxiway J & E unless it provides operational benefit. Currently the pad is restricted to holding B-1900 aircraft or smaller.	The existing Runway 9L Hold Pad provides an operational benefit by allowing general aviation aircraft with additional options for queuing or by-passing during intersection departures from Future Runway 9R. This hold pad could be removed at such time that it is no longer viable for aircraft operations.

Ref. No.	Comment	Response
B-75)	Remove Taxiway R at the intersection of Taxiway B and Runway 4L from a runway safety standpoint.	Taxiway R has been removed for the portion of taxiway located northwest of Runway 4R-22L. The taxiway configuration at the intersection of Taxiway B and Runway 4L is an existing condition assumed essential for aircraft operations. It may be appropriate for the O'Hare Runway Safety Action Team (RSAT) or Surface Incident Prevention Team (SIPT) to review and comment on the disposition of this existing condition.
B-76)	Shifting Taxiway H1 to the west and expanding the width of the taxiway creates a potential runway safety issue and is not recommended. This particular area contains high traffic from aircraft access and egress into United's North Port and also contains high vehicular traffic associated with airline ground support equipment on the terminal apron.	(See response to comment B-72)
B-77)	Depict the parallel runway separation distance between Runway 9R/27L and 10L/28R.	9R-27L to 10L-28R CL separation distance now shown
B-78)	The following buildings/facilities located in the RPZ must be removed. **a.** #572: Hertz Rental Car Maintenance **b.** #580: Budget Rental Car Administration **c.** #569: Dollar Rental Car **d.** #574: Avis Car Rental Administration and Maintenance **e.** #570: National Car Rental Administration **f.** #568: Avis gas island **g.** #566: Hertz gas island	Buildings removed from 27L RPZ per comment
B-79)	Move the Runway 9R Localizer building eastward to clear the object free area.	9R localizer building re-sited per comment.

PHASE 2B - RUNWAY 9C/27C

Ref. No.	Comment	Response
B-80)	Runway 9C Instrumentation:	
a.	Glide Slope and PAPI. The glide slope is shown only 850 feet from threshold, instead of the nominal 1,050 feet. Corrective action will be required to meet Glide slope/PAPI FAA standard siting criteria. The centerline of the connector taxiway behind the shown PAPI is 1,374 feet from threshold. The glide slope antenna mast stands 1,050 feet from runway threshold, the PAPI sited anywhere between 300' and 350' behind the glide slope will fall on the connector taxiway behind the glide slope.	9C Glideslope & PAPI longitudinal siting adjusted per criteria to preliminary runway profile, and to avoid connecting taxiway. Glideslope now sited at 1,155' from runway threshold with resultant TCH of 58.3'.
b.	The runway 9C ALSF-2 light lane must cross the railroad tracks at a right angle where the tracks are set widely apart. There is probably insufficient space between tracks to install a light bar tower. An ALSF-2 bridge might be necessary over the tracks and York Road, which are close together, since coherent light bar spacing might not be possible without a bridge. Otherwise, the gap in light bar spacing might be too great to meet current FAA standards. A railroad grade crossing will not be required, since access to the light lane will be possible and easy from both sides of the tracks. A special turnoff on the eastside of York Road would be necessary to access the light bar between York Road and the tracks, if such a bar siting proves feasible. With an ALSF-2 bridge across York Road and the tracks, the turnoff on the eastside of York Road would not be necessary.	9C ALSF-2 light bar stationing adjusted per FAA comments and discussions at NAVAID working sessions. Light bar locations have been adjusted to allow localizer siting at 1,010' from runway threshold and clear the railroad alignment and York Rd. under standard stationing criteria. Access routes have been detailed.
c.	If the building just west of York Road remains, one or two ALSF-2 light bars would have to be mounted on the building. This light bar siting would be a structural, access, safety, and leasing problem that would have to be solved.	Off-airport access to ALSF-2 installations will be provided through avigation easements. Access details will be determined during engineering design. General note added to future ALP to reflect this intent.
B-81)	Runway 27C Instrumentation	
a.	Runway 27C Glide Slope and PAPI. The glide slope is shown only 850 feet from threshold, instead of the nominal 1,050 feet. Corrective action will be required to meet glide slope/PAPI FAA standard siting criteria.	27C Glideslope & PAPI longitudinal siting adjusted per criteria to preliminary runway profile. Glideslope now sited at 1,057' from runway threshold with resultant TCH of 55.0'.
i)	Instead of showing the glide slope 850 feet from Runway 27C landing threshold, show the Glide slope 1,050 feet from threshold.	(See general comment under B-81a)

Ref. No.	Comment	Response
ii)	Show the PAPI 1,400 feet from threshold, which will be 350 feet west of the glide slope. This will give the PAPI ample room to clear connector Taxiway V1 if the excess width of Taxiway V1 is removed. Show Taxiway V1 a consistent 75 feet wide.	(See general comment under B-81a)
b.	The Runway 27C ALSF-2 will have to cross Bessie Coleman Drive, and extend into the parking lot, where some parking spaces will be lost. Actions must be taken to minimize nonstandard intervals between light bars and to facilitate ALSF-2 construction and operation. Those required actions include, but not limited to:	27C ALSF-2 light bar stationing adjusted per FAA comments and discussions at NAVAID working sessions. Light bar locations have been adjusted to allow localizer siting at 1,010' from THR and to clear Bessie Coleman Drive within standard stationing tolerance. Non-standard stationing is currently represented on the future ALP. Detailed design of this facility may rectify this situation. If not, a NCP waiver may be required.
i)	Route Bessie Coleman Drive such that:	(See general comment under B-81b)
1)	It does not begin widening out to more than 75 feet wide until it is north of runway extended centerline.	(See general comment under B-81b)
2)	Its centerline crosses the runway extended centerline 1,265 from Runway 27C threshold.	(See general comment under B-81b)
ii)	Create light bar sites, 55 feet from both sides of Bessie Coleman Drive, being 1,210 feet and 1,320 feet from threshold, respectively.	(See general comment under B-81b)
iii)	Route the service road such that its west edge crosses the runway extended centerline 1,140 feet from Runway 27C threshold.	(See general comment under B-81b)
iv)	Route the fence not farther east than 1,180 feet from Runway 27C threshold.	(See general comment under B-81b)
B-82)	The National Weather Service Owned ASOS facility is currently located near the existing Runway 14R glide slope building. The future Runway 9C and its connecting taxiways will run through this area and jeopardize the siting criteria of the current ASOS site.	ASOS relocated to a site near the 27L glideslope
	There is a 500' building restriction around the ASOS sensor. The ASOS sensor facility should be relocated and operational before construction begins within 500' of the facility. Construction activity, to include earthwork, in the area of the ASOS can degrade its operation and make in unusable. The ASOS sensor shall be shown on the future ALP.	(See general comment under B-82)
B-83)	VOR/DME Relocation:	

Ref. No.	Comment	Response
	The VOR/DME must be relocated and operational at the new location before construction activity occurs within 1000' of the existing facility. The facility is a vital navigational tool for large numbers of both IFR and VFR aircraft operating in and around Chicago airspace. The VOR/DME will require a reimbursable or similar type relocation agreement. VOR/DME relocation will require revision of 22 Standard Instrument Approach Procedures (SIAPS), 5 Standard Terminal Arrival Routes (STARs), and 3 Departure Procedures (DPs), which may require 12 months or up to 11/2 years lead time based on current workload and complexity.	Detailed phasing plans will be developed by The City of Chicago's O'Hare Modernization Program Office and coordinated with the NAVAIDS Working Group throughout design and implementation to ensure that facility development occurs with minimal operational impacts and maximum efficiency. VOR/DME relocation phasing will be evaluated through this process.
B-84)	Depict the VOR/DME critical area for the relocated VOR/DME. Are the buildings approximately 600' - 1000' to the east of the VOR/DME (i.e., #8029, #8025, #8028, #8018) to remain or be removed?	VOR/DME critical area has been added to the Future ALP. All former military buildings to be demolished.
B-85)	When Runway 9C/27C is commissioned, Runway 14L/32R will be decommissioned, as understood from information provided. Please provide information if this assumption is not correct and the timing of these events.	The current construction schedule plans for RW 14L to be decommissioned after 9C-27C is commissioned.
B-86)	Page 77 of the Project Definition Report describes sections of Runway 14L/32R are to be demolished. Remove all unused portions of this runway.	Abandoned pavement will be demolished within the Object Free Areas. The City of Chicago's O'Hare Modernization Program Office will consider the disposition of abandoned pavement located outside the OFA throughout each interim phase of construction.
B-87)	Review and redesign the future construction of a partial parallel taxiway on the north side of Runway 4L/22R that will create a potentially confusing intersection at its southern end where it connects with Taxiways E and H.	It has been determined that the addition of the Runway 4L-22R parallel taxiway is essential for aircraft operations. The parallel taxiway will be planned such that it does not intersect Taxiway E. This is illustrated on the Ultimate Phase Concept Plan drawing submitted with the ALP on which taxiway centerlines are depicted.

Ref. No.	Comment	Response
B-88)	The new high-speed exit taxiway, for Runway 9C arrivals, on the south side of Runway 9C/27C at its intersection with Runway 4L/22R, should be shifted to the east, to avoid the runway intersection. This may cause a complex intersection (more than 4 corners) where Taxiway Z and former Runway 18/36 intersect and should be further evaluated.	The Runway 9C high-speed exit taxiway will not intersect with Future Taxiway "18-36". This is illustrated on the Ultimate Phase Concept Plan drawing submitted with the ALP where taxiway centerlines are depicted. Taxiway P, which currently intersects Existing Runway 18-36, will be demolished. The optimum location for the runway 9C high-speed exit taxiway is less than the 7,000 feet shown however, due to anticipated traffic located west of this location, 7,000 feet was considered the furthest west that the high-speed should be placed. Moving the high-speed exit further east of this location has a negative effect on runway occupancy time. Furthermore, a high-speed exit location further east could create a complex intersection with Future Taxiway "18-36" and the Runway 9C-27C parallel taxiway.
B-89)	Review and redesign the new high-speed exit taxiway, for Runway 27C arrivals, from the south side of runway 9C/27C at Taxiway E that will create potentially confusing geometry. Possibly, Taxiway E needs to be reconfigured and/or partially removed.	Taxiway E has been partially removed to eliminate a potentially confusing geometry with the Runway 27C highspeed exit taxiway
B-90	This new runway will create some complex configurations, albeit on a temporary basis, at intersections with existing Runway 14R/32L.	Runway 14R-32L will be eliminated by the O'Hare Modernization Program and thus the complex intersections referred to in Comment B-90 will not be applicable. Furthermore, The City of Chicago's O'Hare Modernization Program Office will assess complex intersections that may exist at each interim phase of construction.

Ref. No.	Comment	Response
B-91)	The configuration of the depicted 9C Pad presents some challenges with Taxiway Y crossing directly through the pad. Additional information and study will be needed to see how positive guidance and wingtip separation clearance will be provided between taxiing aircraft and holding aircraft east and west of Taxiway Y.	The ALP depicts existing Taxiway Y pavement utilized as part of the Runway 9C Hold Pad. Taxiway Y will no longer exist as a taxiway in the hold pad area. An Ultimate Phase Concept Plan drawing has been provided that more clearly depicts the configuration of Taxiway Y and the Runway 9C Hold Pad.
B-92)	The pavement configuration at V1 Taxiway both north and south of Runway 27C is unclear on what will be removed versus what is proposed.	Existing Taxiways V and V2 will be removed while Taxiway V1 both north and south of Runway 9C-27C will remain in the OMP. An Ultimate Phase Concept Plan drawing has been provided that more clearly depicts future pavement configuration.
B-93)	The service road system servicing the Northwest Maintenance facilities and adjacent tenant buildings must be designed to eliminate all tenant vehicular traffic from crossing taxiways. Roadways should be tunneled.	Refer to Service Road Study for detail.
B-94)	Buildings 8066 & 8067 (Training Aid Shop) located in the 27C RSA should be shown in green as "To Be Relocated".	All existing buildings located in the 27C RSA will be demolished.
B-95)	The standing water shown in Runway 9C Safety Area must be mitigated.	Creek routed through culvert in 9C RSA per comment
B-96)	Remove the Airport Transit System (ATS) from the Runway 27C RPZ. The Remote Parking ATS station is approximately 1,900' east of the Runway 27C threshold. According to the Project Definition Report, "…it is not anticipated that the concentrations of persons at the ATS station would reach levels of assembly similar to facilities identified in AC 150/5300-13 as inappropriate in the RPZ…" (page 6). Based on additional information provided in a March 25, 2003, letter from The City of Chicago to the FAA, the peak population of the station is 95 people. This was based on the World Gate Way Program estimates. This amount, plus the amount of people in the cars would be considered under AC 150/5300-13 to be a public assembly.	ATS station within Runway 27C extended OFA to be closed per comment

Ref. No.	Comment	Response
B-97)	Remove the Surface long-term automobile parking (Lot E) from the Extended OFA portion of the RPZ. Surface long-term automobile parking (Lot E) is proposed to remain within the OFA extension. According to the Project Definition Report, "There are no parking structures or appurtenances within the OFA-extension. While relocation of the Lot E auto surface parking was considered, such action was determined impractical given landside constraints" (Page 6). AC 150/5300-13 states that "Automobile parking facilities, although discouraged, may be permitted (in the RPZ), provided the parking facilities and any associated appurtenances…are located outside of the object free area extension." Surface Parking is considered a facility due to the large number of vehicles containing fuel.	Parking lot E within Runway 27C extended OFA to be closed per comment
B-98)	Remove building #8067 (Training Aid Shop) from the RSA.	Building 8067 is vacant and will be demolished.
B-99)	Remove the creek or drainage ditch (Willow Creek) located about 850 feet from the Runway 9C RSA.	Creek routed through culvert in 9C RSA per comment
B-100)	Remove approximately 300 feet of pavement located prior to Runway 27L threshold that is marked as a taxiway and place connecting taxiways at actual beginning of the runway (Threshold). Advisory Circular 150/5300-13, paragraph 305 d (2) "The displacement of a threshold that does not also include relocation of the lead-in taxiway can create an undesirable and confusing operating environment for the pilot."	The pavement located prior to the relocated Rwy 27L threshold is required for aircraft taxiing to the threshold for departure operations and will be designated as a taxiway. Pavement will be marked and lighted as per FAA standards specific to this type of configuration in accordance with AC150/5340
B-101)	Due to the potential wildlife attractant, the future landside detention basin located between the Runway 9C and 9R Runway Protection Zones, which is not depicted on the future ALP, must be resolved (off site or underground alternatives).	A detailed analysis of stormwater detention alternatives has been completed and submitted to the FAA under separate cover. The preferred alternative identified in this study is shown on the Future ALP drawing. The City of Chicago's O'Hare Modernization Program Office will work closely with the FAA and USDA Wildlife Services to ensure that adequate wildlife mitigation measures are implemented and that ARFF equipment is available to meet FAA water rescue response requirements.

Ref. No.	Comment	Response
B-102)	Future Runway 9C (Sheet #14)	Future Runway 9C Approach Sheet updated per comment
a.	Depict obstruction evaluation points for terrain that penetrates the approach surface.	(See general comment under B-102)
b.	There are at least two required obstruction evaluation points (existing roads) that are not depicted.	(See general comment under B-102)
c.	There are two sets of parallel railroad tracks crossing under the approach surface, but obstruction evaluation points are only depicted for the closer set.	(See general comment under B-102)
d.	A future on-airport road shown on the future ALP is not depicted in the plan view. This road should be added to the plan view and the appropriate obstruction evaluation points should be depicted.	(See general comment under B-102)
B-103)	Future Runway 27C (Sheet #15)	Future Runway 27C Approach Sheet updated per comment. Parking will be removed from the extended OFA of Runway 27C, and therefore lighting will not be required in this area.
a.	Ensure the alignment of obstruction evaluation points between the plan and profile views (i.e., R7)	(See general comment under B-103)
b.	What is the proposed method for lighting the future automobile parking area depicted under the Runway 27C approach surface (facility P2 on the future ALP) if all of the light poles are to be removed? (See comment #B-93 for removing parking outside of extended OFA.)	(See general comment under B-103)
c.	There are at least two required obstruction evaluation points (existing Bessie Coleman Drive) that are not depicted.	(See general comment under B-103)
d.	Several future roads shown on the future ALP are not depicted in the plan view. These roads should be added to the plan view and the appropriate obstruction evaluation points should be depicted.	(See general comment under B-103)

PHASE 2C - RUNWAY 10R/28L

Ref. No.	Comment	Response
B-104)	Runway 10R Instrumentation:	
a.	The 10R Approach the Glide slope is incorrectly distanced from threshold, instead of the nominal 1,050 feet. Corrective action will be required to meet Glide slope FAA standard siting criteria.	10R Glideslope longitudinal siting adjusted per criteria to preliminary runway profile. Glideslope now sited at 1,070' from threshold, with resultant TCH of 55.0'.
b.	The future ALP incorrectly depicts the proper location for the glide slope facility in relation to the Runway centerline. FAA Order 6750.16C, Siting Criteria for Instrument Landing Systems, Paragraph 27.c. CAT II and III glides slopes should be located at a minimum distance of 400 feet from the runway centerline. It has been observed that to make all elements of the glide slope facility (antenna mast and building) clear the runway OFA the facility would have to be centered 407' off runway centerline. This siting would make the facility encroach upon the taxiway OFA of an Airplane Design Group VI taxiway whose centerline is 600' from runway centerline. This conflict must be resolved.	10R Gildeslope has been sited laterally at 407' from runway centerline.
	The Runway 10R glide slope, shown 325' off runway centerline, must be sited not less than 400' off centerline. The height of the glide slope antenna mast is limited by the height-limiting formula in FAA Advisory Circular 150/5300-13, Airport Design, Paragraph 306c (2)(b). By this formula, the maximum height of an antenna 400 feet from runway centerline is x feet above the elevation of the crown of the runway abeam the glide slope antenna mast. If the finished grade elevation at the glide slope antenna mast is 4.0 feet below the runway crown elevation abeam the mast, then the maximum allowable antenna mast height is x' + 4.0', or (x ft.+ 4 ft) above finished grade. Moving the Runway 10R glide slope out to 400' might require moving the fence and the ditch respectively. In addition, there is a problem with the traffic on Irving Park Road and the fence, where they curve northerly.	(See general comment under B-104b)

Ref. No.	Comment	Response
c.	Runway 10R ALSF-2. The future Bensenville ditch, the airport security fence, future relocated Irving Park Road, and rerouted railroad tracks are all shown crossing through the ALSF-2. These items must be designed to accommodate standard stationing of the ALSF-2 light bars.	10R ALSF-2 light bar stationing adjusted per comment and discussions at NAVAID working sessions. Light bar locations have been adjusted to allow the localizer to be sited at 1,010' from runway threshold and to clear the railroad alignment and Irving Park Road, using a minimum 35' wide median, under standard stationing criteria. Bensenville ditch will be routed through a culvert in the vicinity of the approach light system. Access routes have been detailed.
i)	If possible, reroute the railroad tracks around the end of, instead of through, the ALSF-2. Ideally, the tracks should amply clear the outermost light bar tower of the ALSF-2. If the tracks must cross the ALSF-2, the track design must include ALSF-2 ducts under the tracks, and a grade crossing for the access road.	(See general comment under B-104c)
ii)	The future Bensenville ditch must be culverted near the Runway 10R ALSF-2. The culvert top should extend to at least 50 feet from runway centerline measured in a direction perpendicular to runway extended centerline. Either the culvert must have cable ducts constructed over it, or there must be a 48-inch depth of soil over the top of the culvert for the later construction of cable ducts. These provisions will give sufficient room to construct an access road and cable ducts over the culvert.	(See general comment under B-104c)
iii)	Irving Park Road has an ample median today. That median should continue in the design of rerouted Irving Park Road. Irving Park Road and its median should be designed to place the ALSF-2 16+00 light bar in the center of the median. The median must have guardrails and a paved pull-off for maintenance personnel safety. The median must be designed with a level crushed rock surfaced area for maintaining the light bar tower in the tilted down position. The Irving Park Road design must include ALSF-2 cable ducts running from "right of way" line to "right of way" line, with an electrical handhole at each end, and in the median.	(See general comment under B-104c)
iv)	The ALSF-2 as proposed, will cross over Irving Park Road about 300 feet south of the junction of Irving Park Road with the future airport access road. This junction must permit a left-hand turn from the future airport access road onto Irving Park Road. There must be an access road for the maintenance of the ALSF-2 segment southwest of Irving Park Road. This ALSF-2 access road must enter the southwest side of Irving Park Road. This entrance must be co-linear with the future airport access road on the northeast side of Irving Park Road.	(See general comment under B-104c)

Ref. No.	Comment	Response
B-105)	Runway 28L Approach:	
a.	Runway 28L Glide Slope. The distance from the runway centerline requires correction. The future ALP incorrectly depicts the proper location for the Glide slope Facility in relation to the Runway Centerline. FAA Order 6750.16C, Siting Criteria for Instrument Landing Systems, Paragraph 27.c. Category II and III glides slopes should be located at a minimum distance of 400 feet from the runway centerline. It has been observed that to make all elements of the glide slope facility (antenna mast and building) clear the runway Object Free Area (OFA) the facility would have to be centered 407 feet off runway centerline. This siting would make the facility encroach upon the taxiway OFA of an Airplane Design Group VI taxiway whose centerline is 600 feet from runway centerline. This conflict must be resolved.	Gildeslope is now sited 407' from runway centerline clear of ROFA and TOFA.
	When the glide slope is moved farther from the runway centerline, route the fence outside the critical area. The glide slope is shown 1,050' feet from the threshold, which is acceptable.	Fence routed as close as possible to relocated Irving Park Road. This will still result in fencing through a small portion of the glideslope critical area. A signal interference study may be required and will be coordinated through the NAVAIDS Working Group.
b.	Runway 28L ALSF-2:	
i)	Two lines 200 feet apart run parallel to the runway centerline between the end of the blast pad and Taxiway S. It is believed that these two lines represent a paved area for the facilitation of snowplowing from the end of Runway 28L to Taxiway S. If the DOA intends that the ALSF-2 between the threshold and Taxiway S be semi-flush, we request that these two lines be deleted.	Lines removed per comment
ii)	Frangible lights are to be installed only where they fall on runways or taxiways. The practice of installing semi-flush lights in a threshold-to-taxiway infield (see Runway 28R below) should not be repeated. The best visual guidance, the greatest facility reliability, and the greatest ease of maintenance derive from frangible lights, not semi-flush lights.	Comment noted. The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA through engineering design and implementation.
iii)	We anticipate that semi-flush:	
1)	Steady-burning lights will be installed for all three light bars at station 7+00, and for at least one light bar of stations 5+00 and 6+00, in Taxiway "S"	
2)	Steady burning and flashing lights will be installed at stations 13+00, 14+00, 15+00, and 16+00, in Taxiway S2 and Runway 4R-22L.	

Ref. No.	Comment	Response
3)	In crossing Runway 4R-22L and Taxiways "S" and "S2", the ALSF-2 approach light plane will have to stay very close to the ground. (The approach light plane is the imaginary plane passing through the steady-burning lamp centerlines.) Consequently, the approach light plane will have to be very low from the 28L threshold to approximately station 16+00, just east of the southeast edge of Runway 4R-22L. Only east of that point can the approach light plane rise, and at that point, it will rise at 2.0 percent to the east. It appears that the approach light plane will clear over Irving Park Road by well more than the required 15 feet.	Comment noted. The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA through engineering design and implementation.
iv)	To avoid approach light penetration by the Runway 10R Localizer antenna array, see the discussion for the Runway 10R Localizer below.	
c.	The Runway 28L Inner Marker depends on the Touchdown Zone Elevation (TDZE).	Inner marker sited at 915' from 28L threshold resulting in a penetration of the approach lighting plane, which is a non-standard condition and may require a NCP waiver. The City of Chicago's O'Hare Modernization Program Office will continue to work closely with the FAA through engineering design and implementation.
i)	There is a chance that the Runway 28L Inner Marker could be sited within longitudinal tolerance about 1,000 feet from threshold, and 205 to 210 feet north of runway extended centerline. The reason for the offset would be to preclude penetrating the ALSF-2 approach light plane with the IM antenna and cable antenna box. With this siting, the IM would be inside the taxiway safety area, and would be about 70 feet off the taxiway centerline. In that location, the probability of a B-747 nacelle's striking the IM antenna would be greater than an airborne airplane striking the IM antenna sited on runway centerline. Sited on runway centerline, the IM antenna would penetrate the approach light plane by about 4 feet, a non-standard condition. Corrective action will be required to meet current FAA standards.	(See general comment under B-105c)
ii)	The antenna feed cable conduit would have to run to the Inner Marker cable transition box at the antenna from the Runway 10R Localizer/28L ALSF-2 building. The Federal Aviation Administration (FAA) is currently researching to find a length of coaxial cable that would need only one splice in the run, the conduit can run straight from box to building, a distance between 1,200 and 1,300 feet. The conduit would have to be bored and pulled under Runway 4R-22L.	(See general comment under B-105c)

Ref. No.	Comment	Response
d.	Runway 10R Localizer:	10R localizer sited per comment and discussions during NAVAID working sessions
i)	The Runway 10R Localizer antenna array is shown about 1,880 feet from threshold. At this location, the array might not clear under the ALSF-2 approach light plane. Corrective action will be required.	(See general comment under B-105d)
ii)	Moving the array back to 2,150 feet would place it well under the approach light plane, outside the OFA, and abeam the 10R Localizer/28L ALSF-2 building.	(See general comment under B-105d)
iii)	Taxiway routes Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) east flow (Exhibits V-31 and V-35, respectively, of the Airside Simulation Analysis) do not route any airplanes through the localizer critical area except airplanes landing on Runway 10R.	
e.	South Air Traffic Control Tower:	South ATCT siting study to be completed prior to facility development. Provisional site shown on future airport layout plan
	The requirements for two additional Airport Traffic Control Tower (ATCT) facilities are valid from a line of sight perspective. The Air Traffic Division, AGL-510 and the Chicago NAS Implementation Center, ANI-400 will determine and approve the appropriate locations.	(See general comment under B-105e)
i)	The new ATCT site must meet FAA Order 6480.4, Air Traffic Control Siting Criteria.	(See general comment under B-105e)
ii)	The City of Chicago, Department of Aviation must submit an ATCT Siting report indicating the following information:	(See general comment under B-105e)
1)	Distance and depth perception to runway ends.	(See general comment under B-105e)
2)	Maximum to Avoid (MTA) elevations at each site.	(See general comment under B-105e)
3)	Shadow studies at each site.	(See general comment under B-105e)
4)	Look down angle radius at each site	(See general comment under B-105e)
5)	A narrative for each site addressing sunrise and sunset impacts, glare and light reflection impacts and employee access	(See general comment under B-105e)
6)	The new site must be large enough (2+ acres) for employee parking, Government Owned Vehicle (GOV) parking a base building and support equipment.	(See general comment under B-105e)
B-106)	See "General Technical Comments #A-46" in this document on runway/taxiway separation for Runway 10L/28R.	See response to Comment A-48

Ref. No.	Comment	Response
B-107)	Runway 14R-32L will be decommissioned when Runway 10R-28L is commissioned as implied in information provided.	Per current phasing plan, runway 14R will be decommissioned when runway 10R, the last runway to be built, is commissioned.
B-108)	Provide information on the future plans for the existing Main Cargo Road. Will it be removed between the future Taft Road and the South Access Road?	Existing Main Cargo Road will be removed. It will be relocated to the west of its existing location and tunneled under the taxiway leading to runway 10R.
B-109)	Main Cargo Road should be depicted as a future tunnel.	See response to B-108 above. Refer to Service Road Study for detail.
B-110)	Evaluate the south taxiway entrance to Runway 28L where it crosses through the 4R Hold Pad to determine (what if any) aircraft can be held inside this pad while providing adequate wingtip clearance for taxiing and holding aircraft.	The Existing Runway 4R Hold Pad has been reduced in size to provide clearance for the Future Runway 10R-28L Object Free Area (OFA). As a result, this pad will be restricted to aircraft with wingspans up to but not including 118 feet (ADG-III). While holding in the pad, there is sufficient clearance to a B747-400 aircraft located on Taxiway S and/or a B747-400 located on the southern entrance taxiway to Runway 28L. Additionally, there is sufficient clearance for aircraft with wingspans up to but not including 214 feet (ADG-V) to taxi on Taxiway S while another aircraft (ADG-V or smaller) is holding on the entrance taxiway to Runway 28L (hold line located 300 feet south of the Runway 28L centerline).
B-111)	Ensure tunnel headwalls are outside of the Runway 28L/10R RSA.	Headwalls verified clear of runway safety area per comment
B-112)	Remove the portion of the relocated Irving Park Road that penetrates the Runway OFA.	Irving Park Road will be relocated around Runway 10R, and the abandoned existing section demolished.

Ref. No.	Comment	Response
B-113)	Existing airport buildings in gray should be depicted as being removed.	General notes on former military buildings and existing non-airport facilities on the future airport layout plan detail disposition of airport buildings in gray
B-114)	City should evaluate whether or not there is adequate taxiway turn-offs associated with Runway 10R-28L in order to minimize runway occupancy time.	Adequate turn-offs are provided. See Appendix E for detail.

PHASE 2 WEST TERMINAL

No comments except those found under the Project Definition Report, Concept Development/Refinement Report, and Airside Simulation Analysis Section.

RUNWAY 4L/22R

Ref. No.	Comment	Response
B-115)	The intersection of existing Taxiway C, Taxiway Z, the new parallel taxiway to Runway 9C-27C and Runway 4L-22R creates a potentially confusing situation. Do we need existing Taxiway Z for arrivals on Runway 22R, due to simultaneous arrivals on Runway 27L and concern about the use of Taxiway C? How about a large fillet in the northwest corner of the Runway 9C-27C parallel taxiway intersection with Runway 4L-22R to create a high-speed exit onto the parallel taxiway?	Taxiway C and Taxiway Z are existing high-speed exit taxiways strategically located to minimize runway occupancy time for Runway 22R arrivals. These high-speed exits will continue to be used in future operations especially during airfield conditions requiring the use of Runway 22R arrivals. Taxiway Z and the new parallel taxiway to Runway 9C-27C do not intersect. An Ultimate Phase Concept Plan drawing has been submitted with the ALP that more clearly depicts the taxiway centerlines. As an enhancement, fillets have been added to the intersection of Runway 4L-22R and the Runway 9C-27C parallel taxiway to supplement high-speed exits for Runway 22R arrivals.
B-116)	Remove of Taxiway R southeast of Runway 4L, where it connects Taxiway B to Runway 4L-22R. This would create a 4-corner intersection at Runway 4L-22R.	Taxiway R northwest of Runway 4L has been removed to eliminate the existing four corner intersection with Runway 4L-22R. Taxiway R located southeast of Runway 4L is an existing condition assumed essential for airside operations. It may be appropriate however, for the O'Hare Runway Safety Action Team (RSAT) or Surface Incident Prevention Team (SIPT) to review and comment on the disposition of this existing condition.

Ref. No.	Comment	Response
B-117)	Remove Taxiway W between Taxiway J and the Runway 4L threshold, to eliminate a confusing intersection with Taxiway E and Runway 4L-22R.	Taxiway W is an existing condition used by Air Traffic to feed Runway 4L for departures and considered essential for airside operations. However, it may be appropriate for the O'Hare Runway Safety Action Team (RSAT) or Surface Incident Prevention Team (SIPT) to review and comment on the disposition of this existing condition.
B-118)	No runway to taxiway separation distance depicted for Runway 4L/22R.	Drawings revised per comment
B-119)	Remove all penetration to the Runway 4L Safety Area or perform a practicability determination. Table 8 indicates a RSA penetration 800' beyond the runway end. What causes this penetration? It appears that the relocated localizer is approximately 890 feet from the runway end.	Runway Safety Area penetrations will be the subject of further separate analysis conducted by the Department of Aviation in conjunction with the FAA. The DOA will evaluate alternatives to improving those existing runways that are not proposed to be modified as part of the OMP, and implement improvements where practical.
B-120)	Remove all penetrations to the Runway 22R Runway Safety Area. Table 8 indicates two RSA penetrations: a localizer at 720' beyond the runway end, and a service road at 627' beyond the runway end. The table says that the service road is to be relocated, but this is not depicted on the future ALP.	Service road removed from Runway 22R RSA. See response to comment B119.
B-121)	Depict the PAPI on Runway 22R future. It is included in the Airport Data Sheet.	22R PAPI now shown on future airport layout plan and airport data sheet per comment
B-122)	Elevation for future Runway 4L (656.0') does not match the elevation in the RPZ table (655.5') or the existing end elevation (655.5')	4L elevation matched between runway surfaces table and future airport layout plan
B-123)	Airport Data Sheet (Sheet #4)	Runway end elevation discrepancies resolved. 22R PAPI now shown.
a.	Runway end elevation discrepancies:	(See general comment under B-123)
i)	Future 4L: 655.5' in Airport Data Sheet and RPZ table; 656.0 on future ALP.	(See general comment under B-123)
ii)	Existing 36: 652.7 in Airport Data Sheet; 653.4 on RPZ table and future ALP.	(See general comment under B-123)

Ref. No.	Comment	Response
b.	Depict the Future Runway 22R PAPI on the future ALP. It is included on the Airport Data Sheet.	(See general comment under B-123)
B-124)	Existing / Future Runway 22R (Sheet #8)	Existing/Future Runway 22R Approach Sheet updated to address comment. No planimetrics available for area east of I-90 along extended runway centerline
a.	Depict the existing property line.	(See general comment under B-124)
b.	Depict planimetrics for the area beyond Interstate Highway I-90.	(See general comment under B-124)
c.	The future realignment of Bessie Coleman Drive and the secondary connecting roadway shown on the future ALP should be depicted in the plan view and appropriate obstruction evaluation points should be added.	(See general comment under B-124)
d.	An additional smaller future road splits from the realigned Bessie Coleman Drive. This road should be added to the plan view and the appropriate obstruction evaluation points depicted.	(See general comment under B-124)
e.	Add appropriate obstruction evaluation points for the existing Interstate Highway I-90.	(See general comment under B-124)
f.	The future on-airport road traversing the approach surface should be added to the plan view; however, the required obstruction evaluation points are depicted on the sheet.	(See general comment under B-124)

RUNWAY 4R/22L

Ref. No.	Comment	Response
B-125)	Remove all penetration to the Runway 4R Safety Area. Table 8 indicates a RSA penetration 675' beyond the runway end. What causes this penetration? From the runway end, it appears to be approximately 750' to a road, and approximately 860' to the localizer.	Runway Safety Area penetrations will be the subject of further separate analysis conducted by the Department of Aviation in conjunction with the FAA. The DOA will evaluate alternatives to improving those existing runways that are not proposed to be modified as part of the OMP, and implement improvements where practical.
B-126)	Remove all penetrations to the Runway 22L Runway Safety Area. Table 8 indicates a RSA penetration 500' beyond the runway end. The localizer appears to penetrate the RSA approximately 530' from the runway end.	Runway Safety Area penetrations will be the subject of further separate analysis conducted by the Department of Aviation in conjunction with the FAA. The DOA will evaluate alternatives to improving those existing runways that are not proposed to be modified as part of the OMP, and implement improvements where practical.
B-127)	Existing/Future Runway 4R (Sheet #9)	Existing/Future Runway 4R Approach Sheet (Sheet #16) updated per comment
a.	Provide a note concerning the use of "representative" obstruction evaluation points over the existing rail yard as not every railroad track was evaluated separately.	(See general comment under B-127)
b.	There are at least four required obstruction evaluation points (existing roads) that are not depicted.	(See general comment under B-127)
B-128)	Existing/Future Runway 22L (Sheet #10)	Existing/Future Runway 22L Approach Sheet updated per comment
a.	Delete the Runway 28R end elevation from the plan view.	(See general comment under B-128)
b.	There is at least one required obstruction evaluation point (existing road) that is not depicted.	(See general comment under B-128)

C-INDIVIDUAL SHEET COMMENTS

GENERAL

Ref. No.	Comment	Response
C-1)	The future ALP drawing set should have additional pages in order to more clearly depict the stages of airport development. At a minimum the future ALP drawing set should show the currently approved airport layout (May 2002), construction sheets by phase, and a future airport layout.	ALP drawing set includes Existing ALP, phasing concept plans for completion of Phase 1A, 1, ultimate and Future ALP
C-2)	The base map of the RPZs should be an aerial photo.	Aerial photos added to plan view on inner approach sheets
C-3)	Depict all mandatory runway hold lines and instrument hold lines. These lines will assist in determining if aircraft holding positions affect ground movement operations and protect the future instrument approach procedures.	Hold lines added per comment
C-4)	Base mapping inconsistencies	Hold lines updated per comment
a.	Hold lines depicted at "M4", "F", "M3"/9R/27L and on "T"/32L, but not at other locations.	(See general comment under C-4)
b.	Runway/taxiway shoulder (incomplete at 4R end; all existing runway shoulders are gray vs. black on the existing ALP).	Drawings revised per comment
c.	Inconsistency with depiction of taxiway centerlines (i.e., shown for Taxiway T12).	Drawings revised per comment
C-5)	Consider using color-coding to depict each airport component and its associated areas. An example would be all runways would be green and the associated OFA, RSA, POFA would be green with a variation in line type.	Drawing structure makes this difficult to accomplish. Current set-up allows for separation of various elements that are color coded by type. This aids identification of element type.

CONTENTS SHEET (SHEET #1) (REFERENCE APPROACH SURFACE SHEET COMMENTS)

Ref. No.	Comment	Response
C-6)	Rename Sheet 7 to "Existing/Future Runway 4L Approach Surface"	Sheet renamed
C-7)	Rename Sheet 8 to "Existing/Future Runway 22R Approach Surface"	Sheet renamed
C-8)	Rename Sheet 9 to "Existing/Future Runway 4R Approach Surface"	Sheet renamed
C-9)	Rename Sheet 10 to "Existing/Future Runway 22L Approach Surface"	Sheet renamed
C-10)	Rename Sheet 17 to "Existing Runway 27R/Future Runway 27L Approach Surface"	Additional sheet added detailing approach surface of existing runway 27R. Therefore Future Runway 27L name retained.
C-11)	Rename Sheet 19 to "Existing Runway 27L /Future Runway 28R Approach Surface"	Sheet renamed
C-12)	Add a sheet entitled "Existing Runway 9L Approach Surface"	Existing Runway 9L approach sheet added
C-13)	Add a sheet entitled "Existing Runway 9R Approach Surface"	Existing Runway 9R approach sheet added

EXISTING AIRPORT LAYOUT PLAN (SHEET #2)

Use the currently approved ALP dated May 2002, if unable apply the following comments to the plans submitted December 2002.

Ref. No.	Comment	Response
C-14)	List all modifications to FAA Airport Design Standards and list all non-standard conditions (list standard and existing condition).	See Appendix B for operational restrictions and modifications to standards
C-15)	Depict Runway 18/36 and Runway 4L/22R intersection elevation.	18-36 & 4L-22R runway intersection elevation shown per comment
C-16)	Depict runway high and low point elevations.	Runway high, low, touchdown zone and intersection elevations added to all runways
C-17)	Depict runway true bearings (azimuths, not bearings, presented on the Airport Data Sheet).	True runway bearings depicted per comment
C-18)	Depict Precision Object Free Area (POFA).	POFAs added to existing ALP per comment
C-19)	No OFZ penetration data is given (either specify "No OFZ Object Penetrations" in a general note on the sheet or show object penetrations and indicate how they will be eliminated).	Note added per comment
C-20)	No Threshold Siting Surface penetration data is given (either print "No Threshold Siting Surface Object Penetrations" in a general note on the sheet or show the object penetrations and indicate how they will be eliminated).	Note added per comment
C-21)	Depict Airport Reference Point symbol in the legend.	ARP symbol added to legend
C-22)	Legend Issues	Symbols added to legend per comment
a.	There is no PAPI symbol, nor is there a PAPI symbol in the legend. The only indication of existing PAPI's is from the base mapping.	
b.	No road symbol in the legend	
c.	No rotating beacon symbol in the legend	
d.	No topographic contour symbol in the legend	
e.	No wind cone symbol in the legend	
C-23)	Depict the Building Restriction Line (BRL).	Building restriction line added per comment
C-24)	Remove runway edge lights.	Rwy edge lights removed per comment

Ref. No.	Comment	Response
C-25)	Depict key runway stationing.	Not required for ALP
C-26)	Provide note to describing how monuments are protected	Note added per comment
C-27)	Label runway to aircraft parking separations.	Aircraft parking at O'Hare is highly dynamic and difficult to define for existing conditions. Any significant changes to aircraft parking that may pose an obstruction to air navigation are submitted to FAA for review in an FAA Form 7460. Future parking plans will be dependent on carrier gate assignments and needs. For reference to separations, dimensions are provided from runway to taxiway, and taxiway to parking apron service roads.
C-28)	Depict the location of Spine Road	Existing Spine Rd is shown on existing ALP. Spine Road relocation has not yet been constructed, and therefore is not shown on the existing ALP
C-29)	Depict OFZ dimensions (more appropriate for data tables).	OFZ dimensions added per comment
C-30)	Depict taxiway to aircraft parking separation distances (more appropriate for terminal area plans).	Dimensions from taxiway to ramp service roads added per comment
C-31)	Depict taxiway to object separation distances.	Taxiway object free areas depicted. Taxiway centerline to nearest object shown in terminal areas
C-32)	Depict apron dimensions.	Apron dimensions vary significantly, and are not depicted. Taxiway centerline to nearest non-movement area object shown in terminal areas
C-33)	Depict FAA Airspace Review number.	Airspace review number added to future airport layout plan and front cover of ALP set
C-34)	Where is the Runway 36 threshold location (runway length is inconsistent with depicted end elevation arrow)?	Runway 36 threshold located per published coordinates

Ref. No.	Comment	Response
C-35)	Runway 22L and 9L glideslope critical areas are longer than the others. Is this due to different equipment?	22L & 9L GS critical areas verified and correct
C-36)	Verify the dimensions for the Runway 14L/14R CAT III localizer critical areas.	14L & 14R Cat III localizer critical area dimensions verified and correct.
C-37)	Existing Runway 4L end coordinate listed in the table is inconsistent with the coordinate depicted in the Airport Data Sheet (53.86" on existing ALP vs. 53.88" in data sheet).	Rwy 4L end coordinates resolved between ALP and data sheet
C-38)	A VASI-4 is depicted on Runway 4L. This VASI is not listed on Airport Data Sheet and is not listed on the Airport's 5010 form.	4L VASI removed from existing ALP
C-39)	Include avigation easement hatching in the legend and remove individual labels.	Avigation easement hatch added to existing airport layout plan legend and individual labels removed
C-40)	Label for Runway 9R/27L is incorrect (says 9L/27R).	9R label corrected per comment
C-41)	Is the runway marking precedence correct in the intersection of Runways 9R/27L and 14R/32L, and in the intersection of Runway 4L/22R and 9L/27R?	Runway marking precedence confirmed
C-42)	Base mapping inconsistencies:	Hold lines updated per comment
a.	Hold lines depicted at "M4", "F", "M3" at 9R/27L and on Taxiway "T" at 32L, but not at other locations	(See general comment under C-42)
b.	Runway/taxiway shoulder (incomplete at 4R end; black vs. gray)	Drawing revised per comment
C-43)	Why is the approach category depicted within the runway outline? The approach category is runway end specific. For example, existing Runway 14R is Category III, but 32L is only Category I.	Approach category reference removed from runway outline. Refer to airport data sheet for approach specific category
C-44)	The Airport Reference Code (ARC) for Runway 18/36 is not consistent between the RPZ table on the Existing ALP (B-I) and the Airport Data Sheet (B-III). The narrative must support the ARC and approach category for all facilities	18/36 ARC discrepancies resolved
C-45)	Elevations are depicted approximately 500' from each runway end. What does this elevation represent? They do not match the touchdown zone elevations depicted in the Data Tables.	These elevations have been modified to correctly represent the touchdown zone elevations and have been matched with the TDZ elevations detailed in the data table

Ref. No.	Comment	Response
C-46)	Approach visibility minimums contained in the Runway Protection Zone Table do not match those listed on the Airport Data Sheet for the following runway ends: 27R, 9R, 27L, 32R, 32L (1800 RVR vs. ½ mile).	Approach minimums matched between data sheet and airport layout plan
C-47)	Consider depicting taxiway-to-taxiway separation distance for Taxiways "A" and "B" in the vicinity of the existing core terminal.	Taxiway A - Taxiway B CL separation now shown
C-48)	Consider depicting Taxiway "A" OFA in the vicinity of the existing core terminal.	Taxiway A OFA has been added per comment
C-49)	Consider renaming "Runway Protection Zone Table" to "Runway Surfaces Table" as it contains more than just RPZ dimensions.	RPZ table renamed per comment
C-50)	"Trimming" the RSA/ROFA to remove interior line-work could help improve overall clarity.	RSA and ROFA trimmed at runway intersections
C-51)	Use color or alternative method to enhance legibility of labels on the exhibit in the Runway Protection Zone Table (i.e., A, B, X, Y).	Color added per comment
C-52)	Small text in the facility legend is difficult to read.	Font size increased in facility list
C-53)	Bring all text to the front (some text is behind other layers and difficult to read).	Text brought to front per comment
C-54)	Topographic contour elevations are illegible.	Topographic contour elevation font size increased to be legible at scale 1":600'
C-55)	The Runway Protection Zone line color used does not match that depicted in the legend (red in legend and black on the Existing ALP).	Legend updated to reflect correct RPZ line color
C-56)	Glideslope critical area line type used does not match that depicted in the legend.	Legend updated to reflect correct GS critical area line type

FUTURE AIRPORT LAYOUT PLAN (SHEET #3)

Ref. No.	Comment	Response
C-57)	Disposition of all pavement should be clearly shown and not just portions of pavement (areas in OFA).	Abandoned pavement will be demolished within the Object Free Areas. The City of Chicago's O'Hare Modernization Program Office will consider the disposition of abandoned pavement located outside the OFA throughout each interim phase of construction. An Ultimate Phase Concept Plan has been provided with the ALP that more clearly depicts the ultimate airfield configuration.
a.	Taxiway R, Z, P, P3 & P2, M7 and D, hold pad for Runway 28R and Runway 22L.	(See general comment under C-57)
b.	It appears that the eastern portion of existing Runway 14R/32L will be retained as a future taxiway. However, there appears to be future non-taxiway sections of the existing runway within future ROFA/TOFA's (i.e., future 10C/28C, future 10L/28R) that are not hatched to depict removal. Depict if this pavement is removed.	(See general comment under C-57)
c.	Remove the existing pavement outside the limits of the future 75' wide and 100' wide taxiways for the conversion of the existing Runway 18/36 to a taxiway?	(See general comment under C-57)
C-58)	A green rectangle is mistakenly shown about 350 feet east of threshold and 200 feet south of runway 27C centerline.	Green rectangle is the Signature Flight Services building. Facilities table has been updated and building marked for relocation.
C-59)	Navigational aid building color should be changed and all buildings should be numbered. Future FAA buildings are shown in green. The legend indicates the color green as an "Existing Airport Building in AOA to be relocated." Therefore, green NAVAID buildings are misleading. A color change is required. In addition, future navigation aid buildings should be numbered to assist in long-term use and evaluation.	NAVAID building color has been changed per comment. NAVAID buildings have not been assigned numbers due to space constraints on the drawing. The City of Chicago's O'Hare Modernization Program Office will continue to work closely with FAA to assist in evaluation of NAVAID facilities.
C-60)	Depict the location of Spine Road.	Spine road relocation shown on future airport layout plan per comment

Ref. No.	Comment	Response
C-61)	Symbolology for future creek/culverts is unclear. What is the blue dash versus the non-dash versus blue fill indicate (i.e. Willow and Bensenville and End of Runway 27R/9L)? This should be clearly depicted in the legend.	Depiction of future creeks and culverts improved and added to legend
C-62)	Verify that all buildings present on the airfield are depicted.	Facility list updated based on latest information available
C-63)	The disposition of existing non-airport buildings to be located within the future south and north airfield areas (under future 9L/27R and 10R/28L development) need to be shown (i.e., demolition).	Note added to ALP detailing disposition of existing off-airport buildings
C-64)	It appears that the relocation of Willow Creek in the northwest quadrant of the Airport is not fully depicted.	Willow Creek relocation revised per comment
C-65)	Consider including existing avigation easement hatching in the legend and remove individual labels.	Existing avigation easement hatch added to ALP legend and individual labels removed
C-66)	Include a list of future/planned modifications to FAA Airport Design Standards. Limited information describing existing deviations from standards is provided in Section 11 of the Project Definition Report.	See Appendix B for list of operational restrictions and modifications to standards
C-67)	Depict runway true bearings (azimuth, not bearing, presented on the Airport Data Sheet).	True runway bearings depicted on Airport Data Sheet
C-68)	Depict the parallel runway separation distance between Runway 4L/22R and 4R/22L.	4L-22R to 4R-22L centerline separation distance added
C-69)	Depict the POFA.	POFAs added to future airport layout plan per comment
C-70)	No OFZ penetration data is given (either specify "No OFZ Object Penetrations" in a general note on the sheet or show object penetrations and indicate how they will be eliminated).	Note added per comment
C-71)	No Threshold Siting Surface penetration data is given (either print "No Threshold Siting Surface Object Penetrations" in a general note on the sheet or show the object penetrations and indicate how they will be eliminated).	Note added to future airport layout plan per comment
C-72)	Depict mandatory hold line distances from runway centerline.	Hold lines shown and dimensioned per comment
C-73)	Legend Issues:	Symbols added to legend per comment as appropriate

Ref. No.	Comment	Response
a.	No ARP symbol in the legend.	(See general comment under C-73)
b.	No future PAPI symbol in the legend (but used on the plan).	(See general comment under C-73)
c.	No wind cones depicted on the drawing or symbol in the legend.	(See general comment under C-73)
d.	No road symbol in the legend (see specific comment under "Supplemental Comments/Observations" pertaining to the depiction of existing roadway removal).	(See general comment under C-73)
e.	No rotating beacon symbol in the legend.	(See general comment under C-73)
f.	No topographic contour line in the legend.	(See general comment under C-73)
C-74)	No Building Restriction Line (BRL) is depicted. The following general note describes the BRL: "Building Restriction Lines (BRL) adjacent to taxiways are defined by object free areas (OFA). BRL adjacent to runways are defined by Part 77 transitional surface contour 35' AGL (above closest runway centerline)."Consider depicting the BRL on the plan view to supplement this note.	Building restriction line added per comment based on definition provided in AC 150/5300-13, *Airport Design*, Change 7
C-75)	Depict survey monuments or note depicting how the monuments are protected.	Survey monuments depicted per comment
C-76)	Remove the depicted runway edge lights.	Runway edge lights removed per comment
C-77)	Depict key runway stationing.	Not required on airport layout plan
C-78)	Depict runway to aircraft parking separation dimensions if appropriate.	See response to comment C-27.
C-79)	Depict OFZ dimensions – may be appropriate for data tables.	OFZ dimensions added per comment
C-80)	Depict taxiway to aircraft parking separation distances (may be more appropriate for terminal area drawings).	Dimensions from taxiway to apron service road added. All aircraft parking positions are on the opposite side of the service road
C-81)	Depict taxiway to object separation distances as appropriate.	Taxiway object free areas depicted. Taxiway centerline to nearest object shown in terminal areas
C-82)	Depict apron dimensions.	Taxiway centerline to nearest object shown in terminal areas
C-83)	Taxiway OFA depiction appears inconsistent; it may be helpful to show the taxiway OFA for taxiways in the vicinity of future buildings/terminal areas, and also for areas where a taxiway OFA is being utilized to define the boundary for existing pavement demolition.	Taxiway OFA lines added per comment

Ref. No.	Comment	Response
C-84)	Consider renaming "Runway Protection Zone Table" to "Runway Surfaces Table" as it contains more than just RPZ dimensions.	RPZ table renamed per comment
C-85)	Use color or alternative method to enhance legibility of labels on the exhibit in the Runway Protection Zone Table (i.e., A, B, X, Y).	Color added per comment
C-86)	"Trimming" the RSA/ROFA to remove interior line-work could help improve overall clarity.	RSA and ROFA trimmed at runway intersections per comment
C-87)	Small text is difficult to read.	Font size increased
C-88)	Bring all text to the front (some text is behind other layers and difficult to read).	Text brought to front per comment
C-89)	Topographic contour elevations are illegible.	Topographic contour elevation font size increased to be legible at scale 1":600'
C-90)	Glideslope critical area line type used does not match that depicted in the legend.	Legend updated to reflect correct GS critical area line type

AIRPORT DATA SHEET (SHEET #4)

Ref. No.	Comment	Response
C-91)	Runway azimuth depicted in Airport Data Sheet, not runway true bearing.	True runway bearings now shown in data sheet per comment
C-92)	No analysis/depiction of wind coverage for the existing airfield configuration is provided.	Wind coverage for existing airfield added per comment
C-93)	No runway end coordinates for existing Runway 18/36 are provided (cannot verify existing Airport Reference Point without 18/36 coordinates).	Runway end coordinates added per comment
C-94)	Depict POFA dimensions.	POFAs added to existing airport layout plan per comment
C-95)	Depict taxiway lighting type	Taxiway lighting omitted from airport data sheet due to complexity of taxiway system. Taxiway lighting will meet FAA standards in accordance with AC/150-5340-24, AC/150-5340-28 and AC/120-57A.
C-96)	Depict OFZ dimensions.	OFZ dimensions added per comment
C-97)	Aircraft Design Group for existing Runway 18/36 is labeled as "III" in the Airport Data Sheet and "I" in the Existing ALP RPZ table.	ALP updated to show correct ARC per comment
C-98)	Type actual data in future blocks instead of "same".	Data sheet updated to replace 'same' with actual data per comment
C-99)	Consider adding pavement strength for double-dual tandem (DDT) aircraft.	To be considered during engineering design
C-100)	Consider adding "NPI" to "airport related abbreviations" table.	NPI added to abbreviations list per comment
C-101)	Consider adding "ASDE-X" to "airport abbreviations table".	ASDE-X added to abbreviations list per comment
C-102)	Approach visibility minimum inconsistencies between the Airport Data Sheet and the RPZ table on the existing ALP for Runways 27R, 9R, 27L, 32R, and 32L: RPZ table indicates 1800' RVR, while Airport Data Sheet indicates ½ mile.	Approach minimums matched between data sheet and airport layout plan

EXISTING AND FUTURE TERMINAL PLAN (SHEET #5 & 6)

Ref. No.	Comment	Response
C-103)	Existing Terminal Area Plan (Sheet #5) and Future Terminal Area Plan (Sheet #6)*NOTE: All comments pertaining to the future ALP also apply to the Terminal Area Plan(s) base drawing	
a.	No building data table to identify structures. Structure Identification Numbers are presented, but the associated building identification information is only presented on the Future ALP (Sheet #3).	Data tables added per comment
b.	No top elevations of structures are presented (on the terminal area plan(s) or the Future ALP.	Top elevations of structures added per comment
c.	No legend is present.	Legend added per comment
d.	Scale is 1:300 (existing) and 1:400 (future). According to ALP standards, a maximum scale of 1:100 is recommended.	West, core and east terminal areas sheets provided. Scale of 1:100 would split each area onto two sheets. It is considered that each area shown on one sheet at a 1:200 scale would be more useful than breaking area continuity to meet a larger scale requirement
e.	No obstruction marking (existing and planned) data is presented.	See Inner Part 77 Surfaces drawing for obstruction marking information
f.	At a minimum, add a legend and facility list information to the future terminal area plan. (Possibly utilize information presented on Exhibits 16-19 of the *Project Definition Report.)*	Legend and facility list added per comment
g.	Depict aircraft parking position locations on the future terminal area plan. (Possibly utilize information presented on Exhibits 16-19 of the *Project Definition Report.)*	Aircraft parking not depicted on plan. Aircraft parking plans in *Project Definition Report* are representative only. Aircraft parking at O'Hare is highly dynamic and difficult to define for existing conditions. Future parking plans will be dependent on carrier gate assignments and needs.
h.	Provide larger-scale sheets providing greater detail for individual terminal components (i.e., separate sheets for the future core terminal, the future east, and the future west terminal. (Possibly utilize information presented on Exhibit 17-19 of the *Project Definition Report.*)	West, core and east terminal areas sheets provided

Ref. No.	Comment	Response
i.	Consider adding individual large-scale terminal area plan sheets depicting the future south airfield area and the future north airfield area. (Possibly utilize information presented on Exhibits 20-21 of the *Project Definition Report.*)	Various alternatives considered for terminal area representation determined that separate west, core and east sheets provided best combination of detail and continuity
j.	Consider depicting the Aircraft Parking Limit (APL).	Aircraft parking limit typically coincides with the inner edge of the ramp edge service road.
k.	Clearly show service roads.	Service roads shown per comment
l.	Show tail heights and wing spans for parking areas.	Aircraft parking at O'Hare is highly dynamic and difficult to define for existing conditions. Any significant changes to aircraft parking that may pose an obstruction to air navigation are submitted to FAA for review in an FAA Form 7460. Future parking plans will be dependent on carrier gate assignments and needs.
m.	Show separation distances.	Taxiway/taxilane centerline to fixed/movable object distances shown

FUTURE AND EXISTING RUNWAY APPROACH SURFACES (SHEET #7-34)

These comments are based on the review of collective comments from each of the individual Approach Sheets (sheets #7-34) and serve to summarize those observations that were reasonably consistent on at least several sheets. Comments specific to each sheet are addressed under individual runways in the "Phasing Comments" section.

Ref. No.	Comment	Response
C-104)	Traverse ways should be evaluated per the criteria outlined in 14 CFR part 77 [§77.23 (b)] to ensure that the passage of mobile objects will not penetrate Part 77 surfaces. If a penetration exists, a disposition should be noted.	Traverse ways evaluated per comment
C-105)	At a minimum, all existing and future man-made and natural features should be depicted (i.e., roadways, railroads, waterways, fence lines, etc.) in the plan view on the Approach Surface sheets, as applicable. All proposed future development depicted on the Future ALP should be depicted consistently on Approach Surface sheets that evaluate future conditions.	Significant existing and future features are depicted on the approach sheets
C-106)	Depict all obstruction evaluation points for both existing and future traverse ways, showing the traverse way elevation and vertical clearance between the traverse way and the approach surface at the approach surface edges and the extended runway centerline.	Approach sheets updated per comment
C-107)	Existing runway ends that will remain unchanged in the future should have their approach sheets labeled "Existing/Future" instead of simply "Existing" or "Future" or, alternatively, split into two separate Existing and Future sheets. In addition, the runway ends in the profile view on these sheets should be labeled as "existing/future". This comment applies to the following:	Existing/Future label added to runway ends where necessary
a.	Existing Runway 4L	
b.	Existing Runway 22R	
c.	Existing Runway 4R	
d.	Existing Runway 22L	
e.	Future Runway 27L (Existing Runway 27R)	
f.	Future Runway 28R (Existing Runway 27L)	
C-108)	The following existing runway ends are not evaluated with an Approach Surface Sheet:	Existing 9L and 9R approach sheets added
a.	Existing Runway 9L	
b.	Existing Runway 9R	

Ref. No.	Comment	Response
C-109)	Label or depict the threshold-siting surface when applicable.	34:1 TERPS Approach Obstacle Clearance Surface added to 9L and 10R inner approach profile drawings
C-110)	Show the Approach Surface to a 100-foot elevation above the runway end to fully evaluate the impact of potential obstructions to the approach surface.	Inner approach profiles have been adjusted to show 100' above threshold elevation
C-111)	Consider depicting transitional surfaces to better evaluate airspace protection needs	Transitional surfaces and obstruction evaluation points added to plan view of inner approach sheets
C-112)	Label road names, where applicable.	Road names have been labeled
C-113)	Provide a legend for each sheet describing the line types and hatching styles to clarify symbology utilized in the plan view.	Labels provided on plan view to aid identification of drawing elements
C-114)	Add light-colored intermediate grid on the profile section.	Intermediate grid lines added
C-115)	Depict/label NAVAIDs and future NAVAID buildings in the plan view.	NAVAID buildings added per comment
C-116)	Depict/label the OFA and RSA on all sheets.	OFA & RSA now shown on inner approach plans
C-117)	Remove dimensions of pavements from plan view to reduce clutter.	Pavement dimension removed from plan view
C-118)	Remove all RPZ line work to further simplify the plan view.	RPZ lines removed from inner approach plan views
C-119)	Consistently label the extended runway centerline and standardize the runway centerline line type on all Approach Surface sheets.	Same line and label types applied to extended runway centerlines per comment
C-120)	Ensure that leaders in the profile view point to an object and that all leader lines have arrowheads.	Leaders re-pointed where necessary and arrows added per comment
C-121)	Consider depicting elevation lines perpendicular to the centerline of the approach surface in the plan view at intervals of no more than every 50 feet.	Approach surface contours depicted at 10' intervals
C-122)	Reduce the thickness of the property lines on the plan view and ensure that the property line layer is secondary to obstruction points, leader lines, and numbers.	Property line thickness reduced per comment
C-123)	Consistently depict future and existing pavement hatching/coloring on all Approach Surface sheets.	Hatching updated per comment on inner approach sheets

Ref. No.	Comment	Response
C-124)	Depict contour elevations in a legible manner.	Contour elevation font size increased per comment
C-125)	Add titles to all obstruction tables.	Obstruction table titles added per comment
C-126)	Center runways laterally in plan view.	Runways centered laterally in plan view per comment
C-127)	Remove profile view panels if they are not populated with data (i.e., sheets #26 and #27)	Unpopulated profile view panels removed per comment
C-128)	Ensure that the North Arrow is depicted with the correct orientation as the actual plan view for the following sheets:	North arrows revised to correct orientation for each sheet
a.	Runway 4L	
b.	Runway 22R	
c.	Runway 4R	
d.	Runway 22L	
e.	Runway 14L	
f.	Runway 32R	
g.	Runway 14R	
h.	Runway 32L	
i.	Runway 18	
j.	Runway 36	
C-129)	Future Runway 9R (Sheet #16)	Future Runway 9R Approach Sheet updated per comments
a.	It appears that obstruction evaluation point FW1 delineates a future waterway. If so, depict this waterway on the plan view and on the future ALP	
b.	Verify the correct depiction of trees T124-T132 on the plan view.	
c.	Depict the future property line	

Ref. No.	Comment	Response
d.	A future on-airport road shown on the future ALP is not depicted in the plan- view. This road should be added to the plan view and the appropriate obstruction evaluation points should be depicted.	
e.	There are two sets of parallel railroad tracks crossing under the approach surface, but obstruction evaluation points are only depicted for the closer set.	
C-130)	Existing Runway 27R/Future Runway 27L (Sheet #17)	Future Runway 27L Approach Sheet updated to address issues reflected in comments
a.	There are at least three required obstruction evaluation points (existing Bessie Coleman Drive and an on-airport road) that are not depicted.	
b.	Obstruction evaluation points are not depicted for an existing north-south railroad (ATS) that traverses the approach surface where it meets the approach surface edge.	
c.	The future ALP depicts several future roads near I-90, which appear to be on and off ramps. These roads should be depicted in the plan view and the appropriate obstruction evaluation points should be depicted.	
C-131)	Future Runway 10R (1 of 6) Approach Surface (Sheet #22)	Future Runway 10R Approach Sheets updated per comments
a.	The relocated railroad and other future development (i.e., roads) are not depicted in the plan view. (This comment applies to Runway 10R Approach Surface sheets 1 – 6.)	
b.	What is the rationale behind trimming certain existing trees on future property to be acquired by the Airport (i.e., T77, T81, T101-T121, T129-T141) instead of removal? (This comment applies to Runway 10R Approach Surface sheets 1 – 4.)	
C-132)	Future Runway10R (2 of 6) Approach Surface (Sheet #23)	Future Runway 10R Approach Sheets updated per comments
a.	Resolutions are missing for several trees/tree clusters (T159-167) in the obstruction table.	
b.	There are several required obstruction evaluation points (existing roads) that are not depicted.	
C-133)	Future Runway 10R (3 of 6) Approach Surface (Sheet #24)	Future Runway 10R Approach Sheets updated per comments

Ref. No.	Comment	Response
a.	There are several required obstruction evaluation points (existing rail yard) that are not depicted.	
b.	The location of obstruction point FR6 (future road) is not depicted on the plan view	
c.	The appropriate obstruction evaluation points for the relocated railroad should be depicted.	
C-134)	Future Runway 10R (5 of 6) Approach Surface (Sheet #26) How can obstruction points B85 and B86 (buildings) be removed when they are not within the future property that is to be acquired by the Airport?	Future Runway 10R Approach Sheets updated per comment
C-135)	Future Runway 28L Approach Surface (Sheet #28) There is at least one required obstruction evaluation point (existing road) that is not depicted.	Future Runway 28L Approach Sheets updated per comment
C-136)	Existing Runway 14L Approach Surface (Sheet #29)	Future Runway 14L Approach Sheets updated per comment
a.	Label Runway 14L end elevation.	
b.	There is at least one required obstruction evaluation point (existing road) that is not depicted.	
C-137)	Existing Runway 32R Approach Surface (Sheet #30)	Future Runway 32R Approach Sheets updated per comment
a.	Label Runway 32R end elevation.	
b.	There are several required obstruction evaluation points (existing road) that are not depicted.	
C-138)	Existing Runway 14R (Sheet # 31)	Future Runway 14R Approach Sheets updated per comment
a.	Label Runway 14R end elevation.	
b.	There are at least four required obstruction evaluation points (existing railroad and a road) that are not depicted.	
C-139)	Existing Runway 32L (Sheet # 32)	Future Runway 32L Approach Sheets updated per comment
a.	Label Runway 32L end elevation.	
b.	There are at least three required obstruction evaluation points (existing roads) that are not depicted.	

Ref. No.	Comment	Response
C-140)	Existing Runway 18 (Sheet # 33)	Existing Runway 18 Approach Sheets updated per comment
a.	Label Runway 18 end elevation.	
C-141)	Existing Runway 36 (Sheet # 34)	Existing Runway 36 Approach Sheets updated per comment
a.	Label Runway 36 end elevation.	
b.	There are at least two required obstruction evaluation points (existing roads) that are not depicted.	
c.	The Part 77 approach slope in the upper profile view is not labeled.	
d.	Consider re-distributing obstruction evaluation point labels over a wider area to increase legibility.	

FUTURE AIRPORT LAYOUT PLAN PART 77 SURFACES DRAWING (SHEET #35)

Ref. No.	Comment	Response
C-142)	No dashed surfaces are provided to indicate less-demanding surfaces (i.e., where the approach surface extends above the horizontal surface)	Dashed lines added per comment
C-143	Verify that no Part 77 penetrations exist other than the penetrations associated with Buildings #612 and #613 located within the South Airfield Area (FedEx and Northwest Cargo Buildings) since no other penetrations are depicted.	Verified - no other penetrations exist
C-144)	Show a note stating, "Refer to the inner portion of the approach surface plan view details for close-in obstructions."	Note added per comment
C-145)	Depict approach profiles.	Approach profiles depicted for first 10,000' of approach surface for future runways
C-146)	The scale is 1:4000 for the plan view. A maximum scale of 1:2000 is recommended.	Inner Part 77 plan view at 1:2000 scale added
C-147)	Provide information specifying any height restriction zoning ordinances/statutes in the airport environs.	The State of Illinois regulates height of structures in the airport environs through the Chicago-O'Hare International Airport Zoning Regulations. These regulations are codified in Title 92 of the Illinois Administrative Code, Chapter 1, Subchapter b, Part 28.
C-148)	Future runways should be depicted on the plan view.	Future runways depicted per comment
C-149)	Airport elevation should be 666' MSL and the Horizontal surface elevation should be 816' MSL.	Airport Elevation set by highest runway end, which is Future Runway 10C at 668.3'. Therefore airport elevation is 668' and horizontal surface is 818'
C-150)	"TBD" is not a reasonable resolution for the road penetrations with out justification.	Road does not penetrate TERPS missed approach surface. Resolution to be determined based on airspace review
C-151)	Consider referencing the source of USGS base maps (quadrangles used, dates, etc.)	Base mapping source referenced

EXISTING AND FUTURE ON-AIRPORT LAND USE PLAN AND EXISTING OFF-AIRPORT LAND USE DRAWING (SHEET #36, 37 & 38)

Ref. No.	Comment	Response
C-152)	Existing/Future On-Airport Land Use Drawing and Existing Off-Airport Land Use Drawing (Sheets #36, 37 and 38)	
a.	Depict the Runway Visibility Zone for intersecting runways (existing (sheet 36) or future (sheet 37) on-airport drawings).	Runway visibility zone added per comment
b.	Depict the Building Restriction Line on the existing (sheet 36) or future (sheet 37) on-airport drawings.	Building Restriction Line added per comment
c.	Depict the recommended future off-airport land use to at least the 65 DNL contour (only existing off-airport land use is depicted on sheet 38).	Noise contours will be provided as part of the EIS Study not yet completed.
d.	The location of all public facilities (i.e., schools, hospitals, prisons, etc.) is not depicted (other than a color for "institutional" land uses) on the existing off-airport land use drawing (sheet 38).	Locations of schools, hospitals/nursing homes, places of worship and libraries added per comment
e.	Include an Airport Property Drawing with the ALP set.	DOA maintains airport property information separate from the ALP in a document entitled "City of Chicago's Land Ownership Property Rights at O'Hare International Airport"– 2nd Edition 1987". This document will be updated to reflect property acquired under the OMP.
f.	Although the property line is obvious on the existing and future on-airport land use plans, the line type does not match that in the legend.	Legend updated per comment
g.	Aerial photos not used for the base map (nice aerials are used for exhibits in the *Project Definition Report*).	Aerial photography cannot be used for base mapping on land use drawings. Hatching used to depict land use types obscures photographic images attached to drawings.
h.	Depict the existing or future 65 DNL noise contours.	Existing and future noise contours will be developed as part of the environmental process for the OMP
i.	Existing On-Airport Land Use Drawing Comments (Sheet 36):	

Ref. No.	Comment	Response
i)	What is the difference between the areas without color and the area shaded green and labeled as "Open and Other"?	Land use drawings have been updated to show land use hatching on all areas. Previously unhatched areas are now hatched to correctly detail land use.
ii)	Why are future buildings shown in the green shaded area denoted as "Open and Other"?	Future buildings in the O'Hare Express North area were incorrectly shown on existing on-airport land use drawing and have been removed
iii)	What is the distinction between "Open" and "Other"?	Open indicates no existing or planned future use of area - other indicates an existing or planned future land use that cannot be categorized under the land-use types listed in the legend
iv)	AOA line type needs to be brought to the front.	Fenceline brought to front per comment
j.	Future On-Airport Land Use Drawing Comments (Sheet 37).	
i)	No future acquisitions/easements indicated for future RPZ areas extending beyond the airport property.	Avigation easements now shown on future off-property RPZs
ii)	No distinction between existing and future land.	Existing on-airport and future on-airport land use drawing respectively show the existing and future airport property
iii)	Existing buildings under future Runways 10R/28L and 9L/27R are not shown for demolition.	Future on-airport land use drawing updated to show only facilities that will exist in the future
iv)	Series of buildings in the future Terminal 4 apron are not shown for demolition.	Future on-airport land use drawing updated to show only facilities that will exist in the future
v)	Building #891 (City/DOA Warehouse/Skilled Trade Center) is shown as future rather than existing.	Building 891 now shown as existing on existing on-airport land use drawing
vi)	Depict future/relocated VOR and its critical area and modifying future land use, if applicable.	VOR and critical area added to future on-airport land use drawing

Ref. No.	Comment	Response
vii)	The definition of the airfield area is inconsistent. On the existing sheet the airfield area is consistently bound by the AOA fence-line. On the future sheet, it exceeds the AOA and is at times bound by the property line, the RPZ limits, or an arbitrary location (i.e., Runway 22L end).	Future on-airport land use drawing updated to show AOA bounded by fenceline
viii)	What is the difference between the areas without color and the area shaded green and labeled as "Open and Other"?	Land use drawings have been updated to show land use hatching on areas previously unmarked
ix)	Why are future buildings shown in the green shaded area denoted as "Open and Other"?	Future buildings were incorrectly shown on future on-airport land use drawing and have been removed
x)	What is the distinction between "Open" and "Other"?	Open indicates no current or planned future use of area - other indicates an existing or planned future land use that cannot be categorized under the land-use types listed in the legend
xi)	Airport Reference Point symbol is not depicted in the legend.	The Airport Reference Point (ARP) previously shown on the existing and future land use drawings are not required and have since been removed. Legend no longer applicable.
xii)	Future on-airport land use drawing water color does not match legend	Legend updated per comment
k.	Existing Off-Airport Land Use Drawing (Sheet 38)	
i)	Source data should clarify the titles of the maps used. Are they existing or future land use maps?	Data references added to land use drawings
ii)	The plan set does not include a future off-airport land use drawing. It is assumed that the development and depiction of future noise contours would be an essential component of this plan. If future noise contours do not exist, it may be prudent to at least depict future airfield facilities and runway approach surfaces to identify off-airport impacted areas that would require land use modifications.	Future off-airport drawing not included per response to comment C-152c